Microbiology and Immunology

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Administration:
Head of the Department: Susan R. Ross
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Program Codes:
20FS1468MS (MS)
20FS1468PHD (PhD)

The Department of Microbiology and Immunology offers formal admission to the Doctor of Philosophy degree program and participates in the Medical Scientist Training Program (see the Medical Scientist Training Program (http://catalog.uic.edu/gcat/colleges-schools/medicine/mstp) section of the catalog for more information). The department carries out basic research in the areas of immunology, virology, and microbial molecular biology. Research leading to a graduate degree is available in the general areas of molecular, cellular, and tumor immunology; molecular biology and genetics of prokaryotes; and molecular biology of viruses.

Admission and Degree Requirements

• MS in Microbiology and Immunology (See listing for PhD in Microbiology and Immunology)
• PhD in Microbiology and Immunology (http://catalog.uic.edu/gcat/colleges-schools/medicine/mim/phd)

Microbiology and Immunology Courses

MIM 425. Fundamentals of Immunology and Microbiology. 3 hours.
Mechanisms of host defense; antigens, immunoglobulins and their reactions; antibody synthesis, regulation and the cellular immune response; bacterial and viral structure and function; mechanisms of pathogenesis. Course Information: Prerequisite(s): Consent of the instructor or registration in the College of Medicine.

MIM 426. Microorganisms as Agents of Human Disease. 3 hours.
Fundamental aspects of bacterial, fungal and viral pathogenesis, therapy, control and prevention of infectious diseases. Course Information: Prerequisite(s): Consent of the instructor.

MIM 455. Microbiology Laboratory Rotation. 3 hours.
Course in basic and applied methods essential for the study of nucleic acids, immunoglobulins, gene transfer, cell fusion, virological and immunological methods. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours. Students may register in more than one section per term. Prerequisite(s): Graduate standing.

MIM 513. Principles of Structure Determination and Analysis. 3 hours.
Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Course Information: Same as BCMG 513, and PMPG 513. Prerequisite(s): GCLS 501 and one year of physical chemistry, or consent of the instructor.

MIM 551. Advanced Immunology. 2 hours.
Concepts in immunochemistry, immunogenetics, molecular immunology, cellular immunology and immunopathology at the intermediate level. Course Information: Prerequisite(s): GCLS 501, GCLS 502, GCLS 503 and GCLS 510 or consent of the instructor.

MIM 553. Molecular Biology of Viruses. 2 hours.
Animal viruses including basic structure and viral nucleic acids; emphasizes molecular organization of viral genomes; cellular and molecular events during virus replication and viral transformation. Course Information: Prerequisite(s): GCLS 501, GCLS 502, GCLS 503, and GCLS 511 or consent of the instructor.

MIM 554. Molecular Aspects of Microbiology. 3 hours.
Basic concepts of prokaryotic and eukaryotic genetics; gene structure and function; gene expression; molecular aspects of mutation and recombination; chromosome structure and function. Course Information: Prerequisite(s): BCHE 460.

MIM 560. Microbial Pathogenesis. 2 hours.
Genetics, molecular biology and physiology of pathogenic bacteria, and host-pathogen interactions. Course Information: Credit is not given for MIM 560 if the student has credit for MIM 552. Prerequisite(s): GCLS 501, GCLS 502, GCLS 503, and GCLS 511 or consent of the instructor.

MIM 585. Cell Biology. 4 hours.
Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. Course Information: Same as ANAT 585 and PHVB 585.

MIM 594. Special Topics in Microbiology, Immunology and Virology. 1-2 hours.
Advanced topics are covered in depth. Topics vary yearly. Course Information: Prerequisite(s): BCHE 460 and MIM 451 and MIM 455 and MIM 552 and MIM 553 and consent of the instructor.

MIM 595. Seminar in Microbiology and Immunology. 1 hour.
Topics of current research interest are presented by guest lecturers from outside institutions in areas of molecular biology, bacteriology, virology and immunology. Course Information: Satisfactory/Unsatisfactory grading only.

MIM 598. Research in Molecular Biology and Immunology. 0-16 hours.
M.S. thesis research on problems in microbiology, immunology, virology and molecular biology. Course Information: Satisfactory/Unsatisfactory grading only. Prerequisite(s): Graduate standing in microbiology and immunology.

MIM 599. Research in Molecular Biology and Immunology. 0-16 hours.
Ph.D. thesis research on problems in microbiology, immunology, virology and molecular biology. Course Information: Satisfactory/Unsatisfactory grading only. Prerequisite(s): Graduate standing in microbiology and immunology.
Graduate College Life Sciences Courses

GCLS 500. Physiology. 3 hours.
Lectures in human physiology. Emphasis is on an integrated approach to systems physiology. Course Information: Restricted to students enrolled in a graduate program offered through the College of Medicine or Pharmacy or in the Departments of Bioengineering or Biological Sciences, or consent of the instructor. Prerequisite(s): Mathematics, undergraduate physics, organic chemistry, or consent of the instructor.

GCLS 501. Biochemistry. 3 hours.
Fundamental properties of biomacromolecules, the thermodynamics underlying basic biochemical processes and the properties of enzymes, including the kinetics of operation, and regulation, illustrated with important examples. Course Information: Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor. Prerequisite(s): Recommended background: Coursework in organic and physical chemistry.

GCLS 502. Molecular Biology. 3 hours.
Core molecular biology course covering basic principles of gene expression, genome replication and molecular interactions important to biological processes in prokaryotes and eukaryotes. Course Information: Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 503. Cell Biology. 3 hours.
Advanced course on fundamental aspects of cell biology; basic concepts will be integrated with key examples which span gene, protein, cell, and tissue function. Course Information: Credit is not given for GCLS 503 if the student has credit in BCHE 561 or ANAT 585 or MIM 585 or PHYB 585. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine, Pharmacy, or Applied Health or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 504. Research Methods I. 1-2 hours.
Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological and biophysical methodology such as separation techniques and studies of biomembranes. Course Information: May be repeated. Students may register for more than one section per term. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 505. Research Methods II. 1-3 hours.
Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological and biophysical methodology such as bioimaging and biochemical analysis. Course Information: May be repeated. Students may register for more than one section per term. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 506. GEMS Research Rotation. 2-5 hours.
Research rotation course in which first year students from the GEMS program will undertake research projects in laboratories affiliated with this program. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Animals used in instruction. Prerequisite(s): Open only to Ph.D. degree students.

GCLS 510. Integrative Biology. 3 hours.
Advanced level, intensive course addressing fundamental topics of developmental biology, immunology, and cancer biology, with concentration on thematic issues that integrate these subjects. Course Information: Prerequisite(s): GCLS 501 and GCLS 502 and GCLS 503; or demonstrated proficiency of the material covered in these courses. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 511. Molecular Genetics. 3 hours.
Core molecular genetics course covering classical and molecular principles of microbial and Mendelian genetics. Systems covered include bacteria, bacteriophage, animal viruses, yeast, Drosophila, mouse, and human. Course Information: Prerequisite(s): GCLS 501 and GCLS 502 and GCLS 503; or demonstrated proficiency of the material covered in these courses. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 512. Pathobiology of Cancer. 3 hours.
Introduction to principles of carcinogenesis, tumor biology, and oncology, including cancer epidemiology, molecular-cellular basis of cancer, tumor progression, invasion and metastasis, and prevention, detection, diagnosis, and therapy of cancer. Course Information: Same as PATH 511. Prerequisite(s): Consent of the instructor. Recommended background: Basic knowledge of molecular and cell biology is highly recommended.

GCLS 515. Receptor Pharmacology and Cell Signaling. 3 hours.
Advanced course on cell-surface and nuclear receptors and mechanisms of signaling through receptors. Provides an overview of receptor theory, hands-on data analysis and lectures and discussions on various signaling mechanisms. Course Information: Credit is not given for GCLS 515 if the student has credit in PCOL 505 or PHYB 505. Prerequisite(s): GCLS 501 or approval of the department. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 594. Special Topics in Life Sciences. 1-4 hours.
Systematic study of advanced selected topics in life sciences from an interdisciplinary approach. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.