MICROBIOLOGIE ET IMMUNOLOGIE (MIC)

Les cours en microbiologie et immunologie (MIC) sont offerts par la Faculté de médecine

MIC 4100 Pathogens and the Environment (3 units)

Fundamentals of health-related environmental microbiology with particular emphasis on human pathogenic micro-organisms. Includes the interrelationship of micro-organisms with their environment, how environmental factors affect microbial survival, ability to spread and cause diseases. Mechanisms used in the environmental control of human pathogens. To be offered every year subject to sufficient demand. Previously MIC 5500.

Course Component: Lecture

Prerequisite: BIO 3124.

MIC 4124 Pathogenic Bacteriology (3 units)

Comprehensive overview of pathogenic bacteria and mechanisms of pathogenesis. Principles of bacterial pathogenicity, host-parasite interactions, diagnosis and prevention. Physiological relation to mechanisms of pathogenicity, major pathogens and treatment. Previously MIC 5224.

Course Component: Lecture

Prerequisite: BCH 3170 or BIO 3170 or TMM 3101, or TMM 3501. Courses MIC 4124, TMM 4108 cannot be combined for units.

MIC 4125 Immunology (3 units)

Introduction of the fundamental principles of immunology and understanding of the basic immunological reactions. Description of nature and chemistry of antigens, antibodies, antibody-antigen reactions, specific humoral and cellular immune responses. Role of the immune system in infections, control of cancers, transplant rejection, autoimmune diseases and allergy. Previously MIC 5124.

Course Component: Lecture

Prerequisite: BCH 3170 or BIO 3170 or TMM 3101. Courses MIC 4125, TMM 3105 cannot be combined for units.

MIC 4126 Virology (3 units)

Survey of viruses that infect bacteria, plants and animals, emphasizing the basic principles of virus structure, classification and transmission. Examination of molecular mechanisms involved in virus replication and virus-host interactions, using as specific examples, pathogenic viruses that infect humans or animals. Previously MIC 5326.

Course Component: Lecture

Prerequisite: BCH 3170 or BIO 3170 or TMM 3101. Courses MIC 4126, TMM 3105 cannot be combined for units.

MIC 4525 Immunologie (3 crédits)

Introduction des principes fondamentaux de l'immunologie et compréhension des réactions immunologiques de base. Description de la nature et de la chimie des antigènes, des anticorps, des réactions anticorps-antigène, ainsi que des réponses immunitaires humorales et cellulaires. Le rôle du système immunitaire dans les infections, le contrôle des cancers, le rejet de greffe, les maladies auto-immunes et les allergies.

Volet : Cours magistral

Préalable : BCH 3570 ou BIO 3570 ou TMM 3501. Les cours MIC 4525, TMM 2505, TMM 3105 ne peuvent être combinés pour l'obtention de crédits.

MIC 5100 Pathogen Interactions and Host (3 units)

This course will examine current issues in microbiology/immunology. Topics to be chosen to allow discussion across the broad areas of virology, immunology and bacteriology. Within each of the modules, the focus will be on host-pathogen interactions at the molecular level, how microorganisms utilize, modify or disrupt host cell functions, including immune cell functions and immune responses, to establish infection and cause diseases, or on immunological diseases which may have an infectious component.

Course Component: Lecture

MIC 5102 Principles of Biomanufacturing (3 units)

This course will cover the fundamental biological principles impacting the development and efficacy of biotherapeutics. The course will also include topics such as the steps related to biomanufacturing processes, analytical development, quality control and assurance.

Course Component: Lecture

MIC 5103 Seminar in Biomanufacturing and Commercialization (3 units)

Seminars on topics of current interest in biomanufacturing and related subjects. Seminars will consist of visiting lectures from entrepreneurs and speakers from industry, regulatory agencies and patient advocate organizations with real-life experience, who will share their stories on the path to production, clinical implementation and commercialization of biological therapeutics.

Course Component: Seminar

MIC 5366 MSc Seminar (3 units)

Attendance at two half-day symposia with guest speakers, attendance and participation in the annual BMI Student Symposium and BMI Poster Day, attendance at BMI seminars relevant to Microbiology and Immunology. Students must present at least one poster and one oral presentation during the course of their program. Graded S (Satisfactory) or NS (Not satisfactory).

Course Component: Seminar

MIC 8120 Advanced Topics in Immunometabolism (3 units)

An advanced study of the recent literature dealing with the field of immunometabolism, with a focus on both immunometabolic pathways and the specialized techniques that allow for understanding chronic inflammatory/metabolic diseases, such as cancer, type 2 diabetes, obesity, atherosclerosis, neurodegeneration, etc.

Course Component: Lecture

MIC 8122 Advanced Topics in Immunology (3 units)

Focus on cellular immunology, including thymocyte maturation, induction and regulation of cellular responses, immune responses to pathogens, immunological memory, tolerance. Student assessments to be conducted by two methods: weekly assessment of student presentations and participation in class discussions; assessment of take-home assignments such as completion of a research grant on a topic covered in the course. To be offered alternate years subject to sufficient demand.

Course Component: Seminar

Note: It is recommended to have completed at least one course in immunology prior to enrolment.

MIC 8124 Advanced Topics in Cell Death (3 units)

Molecular mechanisms of cell death. Particular attention to be paid to role of aberrant cell death in human disease. Offered in the Fall of odd numbered years.

Course Component: Lecture

MIC 8125 Special Topics in Microbiology and Immunology (3 units)

Discussion of current topics in Microbiology and Immunology. Topics to vary from year to year depending on the interest of faculty members offering the course and students. Student assessments to be conducted by two methods: weekly assessment of student presentations and participation in class discussions; assessment of take-home assignments such as completion of a research grant on a topic covered in the course.

Course Component: Lecture

Prerequisite: Permission of the course coordinator.

MIC 8236 Advanced Topics in Virology (3 units)

An in-depth presentation of current topics in virological research. Topics will vary from year to year. To be offered every alternate year subject to sufficient demand.

Course Component: Lecture

MIC 8238 Advanced Topics in Bacteriology - Mechanisms of Pathogenesis (3 units)

Recent advances and current topics in selected areas of bacteriology with emphasis on mechanisms of pathogenesis. Students present and discuss journal articles. Offered every alternate year subject to sufficient demand.

Course Component: Lecture

MIC 8366 PhD Seminar (3 units)

Attendance at two half-day symposia with guest speakers, attendance and participation in the annual BMI Student Symposium and BMI Poster Day, attendance at BMI seminars relevant to Microbiology and Immunology. Students will present a poster in their first and every alternate year, and an oral presentation the second and every alternate year until they have permission to write their thesis. Graded S (Satisfactory) / NS (Not satisfactory).

Course Component: Seminar

MIC 8401 Advanced Topics in Bacterial Genetics (3 units)

Microbial genetic and genomic methods: origin, purpose and functioning. Analysis and use of genomes to study bacterial pathogenesis and host-microbe interactions.

Course Component: Lecture

Prerequisite: MIC 5224 or equivalent.

MIC 8534 Structure et expression des génomes procaryotes et eucaryotes (3 crédits)

Le séquençage des génomes eucaryotes et procaryotes, avec un accent particulier sur les technologies récentes, l'alignement des séquences et les bases de données, et l'assemblage des génomes à partir de données générées par séquençage haut débit. Les études de cartographie comparée incluant les études d'associations pangénomiques basées sur le déséquilibre de liaison pour caractériser les variantes fonctionnelles associées aux traits complexes. L'analyse et la structure de métagénomes microbiens issus d'habitats humains et environnementaux incluant l'analyse structure-fonction des communautés microbiennes, les corrélations entre les maladies humaines et le microbiome ainsi que la phylogénie moléculaire. L'expression génique incluant les mesures de transcriptomes et de protéomes ainsi que l'analyse statistique des données. La combinaison des différentes données omiques pour comprendre les interactions gène-environnement.

Volet : Cours magistral

MIC 9998 Examen de synthèse / Comprehensive Examination

Volet / Course Component: Recherche / Research