Immunobiology and Immunological Techniques

Programme course

6 credits

Immunbiologi och immunologiska tekniker

TVMB17

Valid from: 2017 Spring semester

Determined by
Board of Studies for Chemistry, Biology and Biotechnology

Date determined
2017-01-25

Main field of study
Biotechnology, Engineering Biology

Course level
First cycle

Advancement level
G2X

Course offered for
- Engineering Biology, M Sc in Engineering
- Chemical Biology, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic knowledge in biochemistry, cell biology and microbiology, the corresponding rates Biokemi2, Cell Biology and Microbiology or equivalent

Intended learning outcomes
The course will provide theoretical and practical knowledge of the concepts and methods in immune biology and immunology. After the course, participants will be able to

- give an account of how the inflammatory process is initiated, regulated and controlled in the immune system against various infections. This includes knowledge of various inflammatory mediators and inflammatory cells.
- explain how the body's adaptive immunity are regulated and activated in various infections.
- understand how to exploit the immune system to avoid infections. This involves the ability to explain how vaccines and adjuvant function.
- know the various diseases and problems caused by the immune system and could explain the significance of the immune system has in various cases.
- understand the complexity of the different systems (eg complement system, coagulation and other parts) and how they affect each other.
- account for the theory behind and could use some immunological methods.
- have an understanding of how immunological principles used in industry and research.

Course content
Inflammatory mediators (complement system, reactive oxygen metabolites, lysosomal enzymes, cytokines, chemotactic factors), inflammatory cells (phagocytosed cells, interaction with inflammatory mediators); inflammation process, including immune system development and construction (antibodies structure and function, antibody formation, the interaction between antigen-presenting cells, B - cells and Th) cells, various types of vaccines and adjuvants; diseases and problems caused by the immune system (allergic reactions, autoimmune diseases, problems with different types of implants), immunological methods and principles (antigen-antibody reaction, agglutination, precipitation, including immunofluorescensmetoder flow cytometry and Luminex, ELISA).

Teaching and working methods
The course consists of lectures and laboratory practice including a seminar.

Examination

LAB1	Laboratory work, report of assignments	3 credits	U, G
TEN1	Written examination	3 credits	U, 3, 4, 5

Grades
Four-grade scale, LiU, U, 3, 4, 5

Other information
Supplementary courses: Gene technology and molecular genetics, Biotechnology methods, Molecular Virology.

Department
Institutionen för klinisk och experimentell medicin

Director of Studies or equivalent
Kajsa Holmgren Peterson

Examiner
Jonas Wetterö

Education components
Preliminary scheduled hours: 48 h
Recommended self-study hours: 112 h

Course literature

Janeway's Immunobiology, 8th ed, Kenneth Murphy (2011), Garland Science.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.