



BB2446 Immunology 7.5 credits

Immunologi

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for BB2446 valid from Spring 2022

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Requirements for program students at KTH:

At least 150 ECTS from year 1, 2 and 3, of which at least 100 ECTS from year 1 and 2 and bachelor's degree work must be completed. The 150 ECTS must include completed courses in a program that includes: at least 20 ECTS in chemistry, 20 ECTS in biotechnology, biochemistry and molecular biology.

Requirements for non-programme students:

A total of 20 ECTS in biochemistry, microbiology and genetics / molecular biology. 20 ECTS in chemistry, as well as documented knowledge of English corresponding to English B.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

At the end of the course, the student shall be able to:

- Describe the cells and organs of the immune system
- Present the structure and function of key molecules of the immune system such as the immunoglobulins, the major histocompatibility complex, T cell receptors, cytokines and others
- Show detailed understanding of the innate and acquired immunity
- Discuss immunogenicity of different antigens, antigen recognition and antigen processing and presentation
- Explain major processes in immunology such as
 - o T-cell activation, maturation, and differentiation
 - o Generation of the humoral immune response
 - o Cell-mediated immunity
 - o The action and regulation of the complement system
- Show fundamental understanding of various disease conditions such as autoimmunity, allergy, hypersensitive reactions, infectious diseases, and immunodeficiency diseases
- Describe the basis for vaccination and the challenges of transplantation
- Combine the knowledge of each addressed principle and be able to reason and discuss how to design a vaccine.
- In theory design an experiment to produce monoclonal antibodies with desired specificity

Course contents

The course immunology intends to give an understanding of the parts and function of the immune system. The course also intends to give insight into different diseases and when the immune system malfunctions.

The course contains:

- Innate and adaptive immunity.

- Development of B-cells and T-cells.
- Clonal selection.
- Generation of diversity of T and B-cells.
- Antigen recognition of T lymphocytes and T-cell-mediated immunity.
- Humoral immunity (mediated by B cells and antibodies).
- MHC (Major Histocompatibility Complex)
- Antibodies (structure and function)
- T-Cell receptors (structure and function)
- Cell communication.
- The complement system
- When the immune system has malfunctioned: Autoimmunity, allergy.
- The body defence against infection.
- What happens when the immune system malfunctions.
- Allergy and allergic diseases.
- Autoimmunity and transplantation.
- How one can manipulate the immune system.

Examination

- TEN1 - Written exam, 7.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.