BB2445 The Immune System in Health and Disease 6.0 credits

Immunsystemet vid hälsa och sjukdom

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 BB2445 valid from Spring 2016

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Admission requirements for programme students at KTH:
At least 150 credits from grades 1, 2 and 3 of which at least 100 credits from years 1 and 2, and bachelor's work must be completed. The 150 credits should include a minimum of 20 credits within the fields of Mathematics, Numerical Analysis and Computer Sciences, 5 of these must be within the fields of Numerical Analysis and Computer Sciences, 20 credits of Chemistry, possibly including courses in Chemical Measuring Techniques and 20 credits biochemistry, microbiology and genetics/molecular biology.

Admission requirements for independent students:
A total of 20 university credits (hp) in biochemistry, microbiology and genetics/molecular biology. 20 credits of Chemistry, possibly including courses in Chemical Measuring Techniques and 20 credits within the fields of Mathematics, Numerical Analysis and Computer Sciences, 5 of these must be within the fields of Numerical Analysis and Computer Sciences, Documented proficiency in 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

The biotechnological industry in Sweden is growing with many new strong knowledge-based companies with independent research discoveries and innovations. This is a development where we have seen only the beginning, and it means that a good understanding of the immune system is a precondition to be successful as a researcher, developer, or leader in the biotechnological industry of the tomorrow. The future engineer should master the basics of immunology, especially regarding potential applications within medicine (new vaccines, immuno-modulating treatments). Such ability is a precondition to be able to exploit knowledge within biological sciences and for an understanding of biotechnological and biomedical research and its applications.

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

Course contents

On completion of the course, the student should master and be able to explain:

- 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.

- 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.

Course literature

Peter Parham, The Immune System, ISBN 978-0815345268

Examination

- TEN1 - Written exam, 6.0 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.