BB2290 Molecular Biomedicine 7.5 credits

Molekylär biomedicin

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

Establishment

Course syllabus for BB2290 valid from Spring 2020

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Introduction to biotechnology BB1010, Biochemistry BB1040, Cell biology BB1020, Molecular biotechnology BB1060, Bioinformatics DD2396 and Applied gene technology BB2250 or corresponding courses.

Language of instruction

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

Intended learning outcomes

The course aims to provide students an understanding of the use of genome and epigenome information in medicine. The course will give an advanced introduction to epigenetics and its role in health and disease.

After completion of the course the student shall have

Knowledge and understanding to:

- Account for genome variation and related regulatory mechanisms in the context of health and disease
- Describe in detail and summarise single and complex gene disorders as well as explain biological mechanisms associated to cancer

Skills and abilities to:

- Demonstrate critical reading skills in the context of scientific articles
- Examine current genetic approaches/technologies to detect, treat diseases and the role of genetic variation in drug response, metabolism
- Evaluate and choose appropriate approaches and technologies to diagnose a given disease and assess genetic treatment approaches in a given context

Values and approaches to:

- Assess the functional impact of genetic and epigenetic variants in health and disease

All aims have to be fulfilled in order to pass the course. For higher grade (A-D) the student must demonstrate skills, abilities, values and approaches within the subject in a complex context.

Course contents

The role of the genome and the epigenome in medicine will be in focus, both in health and disease conditions. Current and upcoming technologies to analyse genetic and epigenomic features will be discussed. The impact of genome variation will be exemplified with cancer, rare and complex diseases. Strategies for diagnosis and treatment of the diseases are covered, such as gene and stem cell therapy. Diseases related to polymerization and structural changes of proteins such as Alzheimer's disease and prion conditions will also be addressed.

The following subjects will be covered during the course

Human Genome Organisation & Principles of Genetic Variation
Principles of Gene Regulation and Epigenetics
Disease-causing genetic variants
Single gene disorders
Multifactorial disorders
Genetic Approaches to Treating Disease, including gene and cell therapy
Cancer

Examination

- SEM1 - Project seminar, 2.0 credits, grading scale: P, F
- LAB1 - Laboratory work, 1.0 credits, grading scale: P, F
- TEN2 - Written Exam, 4.5 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.

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

Other requirements for final grade

Attendance to seminar work(s) is mandatory to pass the course.

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.