Course syllabus for

Gene, cell and immunotherapy, 7.5 credits

Gen-, cell- och immunterapi, 7.5 hp
This course syllabus is valid from autumn 2024.
Please note that the course syllabus is available in the following versions:
Autumn2024 , Spring2025

Course code	3BL009
Course name	Gene, cell and immunotherapy
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedical Laboratory Science
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Laboratory Medicine
Decided by	Education committee LABMED
Decision date	2024-03-21
Course syllabus valid from	Autumn 2024

Specific entry requirements

Completed biomedical laboratory science education and Degree of Bachelor of Science in Biomedical Laboratory Science about 180 credits or Bachelor's degree in biomedical laboratory science. In addition, proficiency in Swedish and English equivalent to Swedish B/Swedish 3 and English A/English 6.

Objectives

The aim of the course is that the student should obtain solid knowledge in immune, gene and cell therapy including diagnostics methods and treatments in both clinical routine and during development. The achieved level of knowledge should allow the student to participate in research projects in the area and the student should be able to give an account of what Good manufacturing practice (GMP) - certified activities are.

Knowledge and understanding

- Explain the state of knowledge in gene, cell and immunotherapy, including gene editing with CRISPR, allogeneic stem cell transplantation, CAR T cell therapy, oligonucleotides, immunotherapies and clinical use of these.
- Explain how immune, gene and cell therapies, such as CRISPR and CAR T cells, are produced and how they can cure monogenetic diseases and cancer.
- Explain methods in GMP production, requirements to produce cell therapies and laws and rules

regarding stem cell transplantation.
- Compare the pros and cons of the different modalities of gene editing, allogeneic stem cell transplantation and oligonucleotides for the treatment of monogenetic diseases

Skills and abilities

- Analyse GMP workflows and propose how they can be improved.

Values and perspectives

- Demonstrate self-awareness and individual responsibility concerning knowledge development
- Discuss limitations and ethical issues in the area such as potential risks and effects of CRISPR/Cas9 gene editing, nucleic acid therapies and cell therapies.
- Reflect on the supply and demand of gene therapeutics drugs from a global perspective

Content

The course content is based on, and is a specialisation of, previous knowledge in biochemistry, cell and molecular biology from the undergraduate programme. The course is divided into three fields, cell-, gene- and immunotherapy. The course includes diverse subjects such as Good manufacturing practice (GMP), Advanced Therapy Medicinal Products (ATMP), both viral and non-viral gene therapy, gene editing, oligonucleotide- and mRNA treatments, genetically modified cells and antibodies that influence the immune system. Diagnostics methods connected to the treatments will also be discussed.

Teaching methods

The course takes place at a distance supported by a web-based virtual learning environment. Compulsory scheduled components will include seminars, presentations and examinations. The teaching and learning is based on student-centred and student-activated learning. Lectures will be given digitally and have elements of interactive components. The students will work in groups on a project during the course. In the course, it is included to read and comment on course literature, national and international reports and scientific articles.

Examination

The course is examined through an oral examination (Fail/Pass/Pass with distinction)online that is carried out at the end of the course. Furthermore, will a project work be carried out (Fail/Pass)in groups that are presented at the end of the course. The assignment for the project work is to present a proposal on an improvement or new product/method/treatment in one of the three subject areas gene, cell and immunotherapy.

Students who do not pass a regular examination are entitled to re-sit the examination on five more occasions. If the student has failed six examinations/tests, no additional examination is given. Each occasion the student participates in the same test counts as an examination. Submission of a blank exam paper is regarded as an examination. In case a student is registered for an examination but does not attend, this is not regarded as an examination.

In case of the existence of special reasons, or need for adaptation for a student with a disability, the examiner may decide to depart from the syllabus's regulations on examination form, number of examination opportunities, possibility of completion or exemption from compulsory educational elements, etc. Content and intended learning outcomes as well as the level of expected skills, knowledge and abilities must not be altered, removed or lowered.

Compulsory participation

Seminars and presentations are compulsory. The examiner decides if, and how, absence from

compulsory parts can be compensated. Study results cannot be reported until the student has participated in compulsory course elements or compensated for any absence in accordance with instructions from the examiner. Absence from a compulsory educational component may mean that the student cannot take the opportunity until the next time the course is given.

Other directives

The course is given in Swedish and English. The majority of the reading list is in English. Course evaluation is carried out according to the guidelines that are established by the Committee for higher education.

Literature and other teaching aids

Vetenskapliga artiklar kommer att tillhandahållas löpande under kursen

Institutionen för laboratoriemedicin,

Genetiska sjukdomar
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1. uppl. : Stockholm : Liber, 2011 - 326 s.
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