Stem Cells and Applied Regenerative Medicine

Programme course

7.5 credits

Stamceller och tillämpad regenerativ medicin

8MEA11

Valid from: 2020 Autumn semester

Determined by
The Board for First and Second Cycle Programmes at the Faculty of Health Sciences

Date determined
2012-12-07

Revision date
2014-10-06

Main field of study
Medical Biology

Course level
Second cycle

Advancement level
A1X

Course offered for
- Master's Programme in Experimental and Medical Biosciences

Specific information
Stem cell research and regenerative medicine are new interdisciplinary fields in biomedical sciences that aim to replace defective parts or cells in the human body. The aim of this course is to introduce students into selected topics of regenerative medicine, and to provide deeper knowledge about stem cells. The course is elective semester three in the Master's Programme in Experimental and Medical Biosciences.

Entry requirements
Bachelor's degree in a major subject area with relevance for biomedical sciences, equivalent to a Swedish Kandidatexamen with at least 90ECTS credits in the following subjects:

- biochemistry
- cell biology
- molecular biology
- genetics
- gene technology
- microbiology
- immunology
- physiology
- histology
- anatomy
- pathology

or similar

English corresponding to the level of English in Swedish upper secondary education (Engelska 6) .

Exemption from Swedish.

Intended learning outcomes

By the end of this course the student will be able to:
Knowledge and understanding

- Describe various types of stem cells in the human body and their potential in regenerative medicine
- Describe the use of different basic biomaterials in regenerative medicine, and their interaction with host tissues
- Identify host – graft interactions with the focus on immune- and infectious issues related to regenerative medicine

Competence and skills

- Account for and discuss regulatory aspects of regenerative medicine, especially those related to transfer of experimental therapies from the laboratory to the clinic
- Apply technologies used for tracking of implanted stem cells and their derivates
- Identify stem cells in order to separate and purify them

Judgement and approach

- Identify and critically address a scientific question in regenerative medicine

Course content

- Classification, biological properties, and differentiation of stem cells
- Stem cells and cancer
- Stem cells and biomaterial interactions
- Evolution of bioengineered materials
- Host-graft interaction and the relation with immune and infection issues
- Reprogramming and tracking
- Techniques for in vivo visualization of cells and tissue
- Transfer of experimental therapies from the laboratory to the clinic

Teaching and working methods

General: Linköping University Master's Programme in Experimental and Medical Biosciences applies student-centered learning among which Problem Based Learning (PBL) is one pedagogical philosophy and method. To prepare the students for future employment, practical and experimental work in laboratory settings are important parts of the programme in courses as well as in individual projects.
Specific: In this course, lectures, seminars, demonstrations and laboratory work are used.

Examination

Compulsory items
Active participation in the compulsory parts is necessary to pass the course, and assessment of them is carried out continuously. Compulsory parts in this course are: laboratory work, demonstrations, and seminars.

Examination
Individual written examination.
Written report and oral presentation of laboratory work (group assignment with individual assessment).

Scope of re-examination
The extent of a re–examination shall be similar to the regular examination.

Change of examiners
Students who have failed the course or part of the course twice are entitled to request another examiner for the following examination occasion, unless specific reasons are present.

Registration for examination
The procedure for registration should be stated prior to the commencement of each course. In other respects, regulations concerning examination and examiners are applied in accordance with Linköping University policy.

Grades

Three-grade scale, U, G, VG

Other information

The planning and implementation of a course must take its starting point in the wording of the course plan. The course evaluation included in each course must therefore take up the question how well the course agrees will the course plan.

The course is carried out in such a way that both men's and women's experience and knowledge is made visible and developed.

If the course is withdrawn, or is subject to major changes, examinations according to this course plan are normally offered on a total of three occasions within one year, one of them in close connection to the first examination.

Department

Institutionen för biomedicinska och kliniska vetenskaper