

# Stem Cells and Applied Regenerative Medicine

Single subject course

7.5 credits

Stamceller och tillämpad regenerativ medicin

8FA228

Valid from: 2014 Autumn semester

**Determined by**

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

**Date determined**

2013-10-30

## Main field of study

Medical Biology

## Course level

Second cycle

## Advancement level

A1X

## Entry requirements

At least three years of full-time undergraduate studies (180 credits) in a major subject area with relevance for biomedical sciences. This could include previous studies at faculties of medicine, technology/natural sciences, odontology or veterinary medicine. A major part of courses (90 credits) should be in subjects such as biochemistry, cell biology, molecular biology, genetics, gene technology, microbiology, immunology, histology, anatomy, and pathology. The lowest acceptable grade from undergraduate studies is Pass. Applicants must also have documented knowledge of English equivalent to Engelska B/Engelska 6.

## Prerequisites

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## Intended learning outcomes

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.

### 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 derivatives
- 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 with 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 klinisk och experimentell medicin