



DEPARTMENT OF LABORATORY MEDICINE

H5F6071, Regenerative Medicine and the Immune Microenvironment: A Synergistic Approach, 1.5 credits (hec)

Regenerativ medicin och det immunologiska mikroklimatet: En synergistisk ansats, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by the The Committee for Doctoral Education on 2025-03-13, and is valid from autumn semester 2025.

Responsible department

Department of Laboratory Medicine, Faculty of Medicine

Contributing department/s

Department of Molecular Medicine and Surgery

Prerequisite courses, or equivalent

Knowledge in Immunology. Preferably validated course in basic immunology is demanded of this course.

Purpose & Intended learning outcomes

Purpose

This is a one-week specialized course in regenerative medicine. The aim of the course is to advance the students' knowledge of the critical role and clinical implications of the microenvironment in mesenchymal stem cell therapy. There will especially be a focus on immunological aspects. The course will cover recent advances in stem cell research, particularly in the context of interactions with the immune system. Additionally, the course aims to create valuable opportunities for networking among participating students.

Intended Learning Outcomes

By the end of the course students are expected to be able to:

- 1- Explain how stem cell therapy is used in regenerative medicine and how it can be successfully applied in clinical settings.
- 2- Describe present novel approaches to manipulate both the immune system and stem cells to maximize therapeutic potential.
- 3- Perform two different potency assays used to evaluate the functional properties of mesenchymal stem cells.

Course content

The course covers the following topics:

The intersection of immunology and regenerative medicine, exploring how the environment (including the immune system) influences tissue repair, regeneration, and the integration of transplanted tissues and cells (2 days).

The role of non-hematopoietic cells, including hepatocytes and mesenchymal stem cells from various sources, as well as induced pluripotent stem cells (iPSCs). The course will examine their cell-cell interactions, stem cell-derived extracellular vesicles, and interactions with both the innate and adaptive immune systems (2 days).

A one-day practical session where students will perform experiments using potency assays.

Forms of teaching and learning

The course includes lectures, seminars, and practical training and is delivered over 5 full days, spread across three weeks as follows :

Week 1: Two days

Week 2: Two days

Week 3: One day of practical training (laboratory project)

National and international experts in immunology and regenerative medicine will provide lectures and seminars. The seminars will begin with fundamental concepts before moving on to current challenges and scientific or methodological aspects.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory Components

Students must attend all lectures and seminars and participate in the practical training. If a student is unable to attend a lecture or seminar due to unforeseen circumstances, they will be required to submit a one-page essay on the same topic.

Forms of Assessment

To pass the course, students must actively participate in lectures and seminars and complete the practical training. Summative assessment will be based on a written report of the laboratory project and on oral presentation of a topic relevant to the field, followed by a questions and answers session from other students and the course leader. The doctoral student needs to be able to show that all the intended learning outcomes have been achieved in order to pass the course.

Course literature

Relevant review articles will be provided via Canvas and emailed to students after the lectures.