Faculty of Medicine

BIMM25, Biomedicine: Stem Cell Biology and Regenerative Medicine, 7.5 credits

Biomedicin: Stamcellsbiologi och regenerativ medicin, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by The Master's Programmes Board on 2023-05-23 to be valid from 2023-05-30, spring semester 2024.

General Information

This is an elective course within the Master's programme in Biomedicine.

Language of instruction: English

Main field of studies	*Depth of study relative to the degree requirements*
Biomedicine	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

On completion of the course, the students shall be able to:

- account for important milestones in stem cell research and developmental biology
- define different stem cells, their origins, and their distribution in different organs,
- explain the underlying mechanisms for the self-regeneration and differentiation of stem cells and the role of stem cell niches in maintaining homeostasis
- describe disease development as a consequence of the dysregulation of stem cells, and the possibilities of regenerative models

Competence and skills

On completion of the course, the students shall be able to:

- critically review published research in stem cell biology and regenerative medicine and summarise the biological principles of this research in a brief oral presentation
- identify and discuss current controversies about stem cells and regenerative medicine in published research
- formulate relevant issues about meaningful clinical interventions in regenerative medicine, suggest ways to study these experimentally, and argue for the necessity of such research in a written proposal

Judgement and approach

On completion of the course, the students shall be able to:

- reflect on current scientific challenges within stem cell research and how this research influences society in general
- reflect on ethical issues relating to sustainable stem cell research and regenerative medicine.

Course content

The course covers stem cell biology and regenerative medicine with a focus on the stem cell research areas that are particularly strong at Lund University. The course begins with perspectives on cell plasticity and re-programming, and how regeneration functions. During the following weeks, stem cells are studied from different perspectives i.e. focusing on different stem cell niches and their organs. The course covers complications from dysfunctional stem cells in connection with stem cell therapies and tissue engineering, and highlights the legal and ethical issues surrounding stem cell research. The purpose of the course is to prepare students for work in a field that includes stem cells and regenerative medicine by introducing ongoing research in the area.

Course design

The course is structured around five week-long modules on chosen subjects relating to stem cells and regenerative medicine. The majority of learning methods in the course are student active, which requires students to prepare before each teaching component and participate constructively in the discussions. Each module contains lectures by experienced stem cell researchers, followed by preparation, analysis and discussion of material in compulsory practical exercises, and concludes with an assessed assignment. Students practise extracting relevant information from research articles, synthesising information from different sources, making oral presentations in various formats, and writing in a scientific manner.

Participation is compulsory for all practical components and components involving group exercises.

Assessment

The course has two assessed components:

Course Portfolio 5 credits (Fail/Pass/Pass with Distinction)
2,5 (9 credits, Fail/Pass)

The Course Portfolio includes short chalk-talks, article discussions, oral presentations or the design of questionnaires that ultimately lead to an individual research plan

designed by the student. The multiple-choice questions mainly test the learning outcomes relating to knowledge and understanding.

Other forms of examination may be used if there are special reasons.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
A grade of Pass in all assessed components is required to achieve the grade of Pass as a final grade for the course. To achieve the grade of Pass with Distinction as a final grade for the course, there is, in addition, a requirement for the grade of Pass with Distinction on the research plan and its presentation.

Entry requirements

To be admitted to the course, students must have at least 120 first or second-cycle credits in science subjects, including at least 15 credits in cell biology, 15 credits in biochemistry, 15 credits in pathobiology/pharmacology/toxicology/molecular medicine, 7.5 credits in physiology and 5 credits in stem cell biology or developmental biology.

Further information

Overlapping course: BIMM24 Biomedicine: Stem Cell Biology and Regenerative Medicine, 7.5 credits

Subcourses in BIMM25, Biomedicine: Stem Cell Biology and Regenerative Medicine

Applies from V24

2401 Course portfolio, 5,0 hp
Grading scale: Fail, Pass, Pass with distinction
2402 Multiple-choice questions, 2,5 hp
Grading scale: Fail, Pass