

## **BIMM24, Biomedicine: Stem Cell Biology and Regenerative Medicine, 7.5 credits**

*Biomedicin: Stamcellsbiologi och regenerativ medicin, 7,5  
högskolepoäng*

Second Cycle / Avancerad nivå

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### **Details of approval**

The syllabus was approved by The Master's Programmes Board on 2020-09-08 to be valid from 2020-09-09, spring semester 2021.

### **General Information**

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

*Language of instruction:* English

*Main field of studies*

Biomedicine

*Depth of study relative to the degree requirements*

A1N, Second cycle, has only first-cycle course/s as entry requirements

### **Learning outcomes**

#### **Knowledge and understanding**

On completion of the course, the student will 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 the 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 student will be able to:

- critically review published research in stem cell biology and regenerative medicine and summarise the biological principles in this research in a brief oral presentation,
- identify and discuss current controversies around stem cells and regenerative medicine in published research,
- formulate relevant problems around worthwhile 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 student will be able to:

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

## Course content

The course is comprised of 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 perspective 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 questions 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 of chosen subjects around 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 as well as constructive participation in the discussions. Each module contains lectures with experienced stem cell researchers, followed by preparation, analysis and discussion of material in compulsory practical exercises, and concluded by a graded assignment. Students practise extracting relevant information from scientific papers, synthesising information from different sources, presenting orally in different formats, and writing scientifically.

Participation is compulsory for all practical components and components involving team work.

## Assessment

The course contains two examinations:

1. Course Portfolio 5 credits (Fail/Pass/Pass with distinction)
2. Multiple-choice questions 2.5 credits (Fail/Pass)

The Course Portfolio includes chalk-talks, article discussions, oral presentations or the design of questionnaires resulting in an individual research proposal designed by the student. The multiple-choice questions mainly test the learning outcomes related to knowledge and understanding.

If there are special reasons, other forms of examination may apply.

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 passing grade in all test components is required to achieve the grade of Pass as a final grade on the course. To achieve the grade of "Pass with distinction" in final grade, the grade on the research plan and its presentation requires a "Pass with distinction".

## Entry requirements

At least 120 credits in scientific subjects in first or second cycle, of which a minimum of 30 credits in cell biology, 7.5 credits in biochemistry, 15 credits in human physiology, 7.5 credits in immunology, and 7.5 credits in stem cell or developmental biology at the basic level.

## Subcourses in BIMM24, Biomedicine: Stem Cell Biology and Regenerative Medicine

Applies from V21

- 2101 Course portfolio, 5,0 hp  
Grading scale: Fail, Pass, Pass with distinction
- 2102 Multiple-choice questions, 2,5 hp  
Grading scale: Fail, Pass