



LUND
UNIVERSITY

Faculty of Medicine

BIMB22, Biomedicine: The Cell and its Environment, 15 credits

Biomedicin: Cellen och dess omgivning, 15 högskolepoäng
First Cycle / Grundnivå

Details of approval

The syllabus was approved by The Master's Programmes Board on 2020-09-08 to be valid from 2020-09-15, spring semester 2021.

General Information

The course is compulsory in The Biomedicine Programme and is included in semester 2.

Language of instruction: English

Main field of studies

Biomedicine

Depth of study relative to the degree requirements

G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

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

- explain and compare different principles for how extracellular signals enter the cell and are amplified, transmitted and concluded, and give examples of how signaling pathways are integrated
- give an account of how gene expression is regulated epigenetically, transcriptionally and post-transcriptionally, and explain how gene expression can be manipulated and studied experimentally
- describe structure in relation to function for the specialised cells that constitute the four basic types of tissue (epithelial, connective, muscle and neuronal tissues)
- explain molecular mechanisms by which cell division, apoptosis and DNA repair are regulated in response to the internal and external signals of the cell and how defects in these mechanisms can lead to cancer

- describe the molecular structure and the dynamics of the extracellular matrix and explain how this is connected to the function
- explain how cells interact with the extracellular matrix and with one another, and give examples of how these interactions are regulated
- explain principles and molecular mechanisms for how and why cells move and give examples of biological situations in which this is important
- describe what is required for good laboratory practice (GLP) and adapt a laboratory method
- compare parametric and non-parametric tests that are used to compare statistical outcomes in two or more groups

Competence and skills

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

- identify and present relevant information from research publications on cell and molecular biology issues and relate the information to the context of cell biology
- plan and carry out experiments in order to solve a cell biology problem, interpret and apply method descriptions and statistics, and summarise in writing the laboratory results in a format similar to a research article
- constructively assess their role in group assignments
- apply knowledge of cell biology and statistics to interpret and critically evaluate results from research publications

Judgement and approach

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

- reflect on society's requirements for quality assurance in the development and production of drugs and in the analysis of patient material
- reflect on how constructive feedback affects the quality of their own scientific work
- assess their level of cell biology knowledge and take responsibility for their own development of knowledge based on this assessment

Course content

The course contains specialisation but also a broadening of earlier courses in biochemistry and basic cell biology in the Biomedicine programme. Different cell biology themes are covered each week, such as intracellular signal transduction, gene regulation and non-coding RNA, specialised cells and basic tissue types, cell cycle and cancer, cell interactions, the extracellular matrix and the movement of cells. The course focuses on the molecular and cellular mechanisms that control cells and the basic functions of their surroundings. The course acts as a bridge to future courses in e.g. neurobiology and immunology as well as human organ systems and homeostasis by discussing specialised cells and their role in different physiological and pathophysiological situations. In addition to knowledge of cell biology, the course provides proficiencies in extracting, interpreting and presenting information from research articles and training in solving cell biology problems experimentally through the application of cellular and molecular biology methods. The course contains training components for GLP and quality assurance in the development and production of drugs. The course also provides training regarding working in groups and giving and receiving constructive feedback.

Course design

The learning outcomes for the course are mainly achieved through compulsory, teacher-supported group exercises involving problem-based learning (PBL) according to the seven steps. During PBL, the student trains to take responsibility for their knowledge development and to work constructively in groups. As a complement to PBL, there are also lectures providing support, summaries and/or specialisation. Certain learning outcomes are also highlighted through laboratory components.

In the laboratory components of the course, the students train to plan and carry out experiments in order to solve cell biology problems. The laboratory sessions also provide training to describe research results as well as laboratory and statistical methods in the format that is used in scientific literature.

The competence learning outcomes that apply to scientific literature are achieved during a series of article presentations in which the students read, present and interpret research articles connected with the cell biology themes of the course. The students are trained to give and receive feedback through peer review of the PBL work and scientific laboratory report.

Assessment

The learning outcomes are assessed through:

Course portfolio: 7.5 credits (Fail/Pass/Pass with Distinction)

Written exam 7.5 credits (Fail/Pass/Pass with Distinction)

The learning outcomes with respect to knowledge and understanding are mainly assessed through the written exam. The learning outcomes with respect to competence and skills and judgement and approach are assessed through the written exam and course portfolio. The course portfolio includes submission of the scientific laboratory report and active participation in article presentations, PBL group work, laboratory sessions and figure interpretation seminar.

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.

To achieve the grade Pass as final grade requires a Pass grade for all components. To achieve the grade Pass with Distinction as final grade, requires in addition a grade of Pass with Distinction for the written exam and the scientific laboratory report.

Entry requirements

Biology and Chemistry of the Cell 30 credits and completed courses in Biochemistry and Cellular Metabolism 7.5 credits and Genetics and Genomics 7.5 credits, or at least 37.5 credits from completed first-cycle courses of which at least 15 credits in Eukaryotic Cell Biology, 15 credits in Chemistry/Biochemistry and 7.5 credits in Human Genetics.

Further information

A considerable part of the course corresponds to the earlier BIMA46.

Subcourses in BIMB22, Biomedicine: The Cell and its Environment

Applies from V22

- 2201 Course portfolio, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction
- 2202 Written exam, 7,5 hp
Grading scale: Fail, Pass

Applies from V21

- 2101 Course portfolio, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction
- 2102 Written exam, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction