



**Karolinska
Institutet**

Course syllabus for

Cell- and Molecular Biology, 6 credits

Cell- och molekylärbiologi, 6 hp

This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.

Please note that the course syllabus is available in the following versions:

Spring2008 , [Autumn2011](#) , [Spring2013](#) , [Spring2014](#) , [Autumn2015](#)

Course code	1BA002
Course name	Cell- and Molecular Biology
Credits	6 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Not applicable
Level	GX - First cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Laboratory Medicine
Decided by	Programnämnden för Biomedicinska analytikerprogrammet, inriktning laboratoriemedicin
Decision date	2007-10-15
Course syllabus valid from	Spring 2008

Specific entry requirements

General entry requirements for higher studies, and specific entry requirements as stated in the programme syllabus for the Biomedical laboratory science education or the equivalent. In addition to this, completed courses in Biochemistry 1 and 2 or the equivalent knowledge is required.

Objectives

The aim of the course is that the student should acquire basic knowledge of the structure and function of the eukaryotic cell and its interaction with its environment. On completion of the course, the student should be able to: - account for the basic structure of the eukaryotic cell and the function of cell membranes, cell organelles, cytoskeletons and other structures in the cell - account for the organisation of the cell nucleus and the chromatin, and the chemical structure of the nucleic acids - explain the principles of the genetic information flow in the cell (replication, transcription and translation) - describe how sorting, transport and secretion of proteins take place in the cell - account for signal transduction and intracellular effects of signal transduction - account, at a general level, for extracellular matrix structure, interaction between the cell and extracellular environment - at a general level, account for the cell cycle and its regulation, and mechanisms that govern cell proliferation and cell death - explain principles of heredity of monogenic genetic diseases and interpret simple pedigree

Content

The course starts with an overview of the structure of the cell and important structures, to move on, then, to different parts of the cell and its functions. After that, the structure and function of the cell nucleus are treated. The structure and organisation of the nucleic acids in the cell nucleus, and its function in RNA and protein synthesis are reviewed. How gene expressions may be affected in different ways and what the consequences may be, are discussed at a general level. How proteins are transported, modified and sorted to reach their destination is an important part in the course. Further, cell surface, cell contact with the environment and extracellular matrix, as well as cell signalling via signalling molecules and receptors and various signal pathways, are treated. The cell cycle and its regulation and what affects cell division and cell death are reviewed at a general level. The replication process (DNA replication) during the cell cycle is, however, treated in greater detail. An introduction to classical genetics is given in the form of an overview of heredity principles of monogenic genetic diseases and interpretation of pedigree.

Teaching methods

The teaching is given as lectures and seminars. The students will, during the course, work with questions concerning the different parts in the course, and it should also help them see the relations between the various stages of the cell, and to get an understanding of the cell as a whole. The questions are followed up in seminars.

Examination

The course is examined through a written final examination. Seminars are compulsory. In case of absence, an agreement concerning compensation is made between the student and the responsible teacher. Students who have not passed the regular examination are entitled to participate in five more examinations. If the student is not approved after four examinations, he/she is recommended to retake the course at the next regular course date and may, after that, participate in two more examinations. If the student has failed six examinations/tests, no additional examination or new admission in the course is given. The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination for which the student registered but not participated in, will not be regarded as an examination. However, at most 6 examinations.

Other directives

Course evaluation will be carried out in accordance with the guidelines established by the Board of Education.

Literature and other teaching aids

Cooper, Geoffrey M.; Hausman, Robert E.

The cell : a molecular approach

4. ed. : Washington, DC : ASM Press ; a Sunderland, cop. 2007 - xix, 820 s.

ISBN:978-0-87893-219-1 (Sinauer Associates) LIBRIS-ID:10197179

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