Tumour Biology

Tumörbiologi
7.5 credits

Programme course

8MEA21

Valid from: 2025 Autumn semester

Determined by	**Main field of study**	
Chairman of The Board for First and Second Cycle Programmes	Medical Biology	
Date determined	**Course level**	**Progressive specialisation**
2024-10-18	Second cycle	A1N
Revised by	**Disciplinary domain**	
	Medicine	
Revision date	**Subject group**	
	Medical Biology	
Offered first time	**Offered for the last time**	
Autumn semester 2025		
Department	**Replaced by**	
Institutionen för biomedicinska och kliniska vetenskaper		

Specific information

The course is elective in semester 1 or 3 in the Master's Programme in Experimental and Medical Biosciences. The course is given in English.

Course offered for

- Master's Programme in Experimental and Medical Biosciences

Entry requirements

- Bachelor's degree in a major subject area with relevance for biomedical sciences, equivalent to a Swedish Kandidatexamen with at least 90ECTS credits in the following subjects:
  -biochemistry
  -cell biology
  -molecular biology
  -genetics
  -gene technology
  -microbiology
  -physiology
  -immunology
  -histology
  -anatomy
  -pathology
- English corresponding to the level of English in Swedish upper secondary education
  Exemption from Swedish

Intended learning outcomes

By the end of this course the student will be able to:

Knowledge and understanding

- Describe specific and acquired characteristics of cancer cells as well as the molecular basis of carcinogenesis including its regulation at the cellular level
- Describe how genetic changes and epigenetic factors affect carcinogenesis
- Explain the importance of oncogenes and tumor suppressors in regulating the cell cycle and apoptosis and explain the process of tumor progression and metastasis
- Identify basic risk factors for cancer

Competence and skills

- Design and conduct experiments to analyze how alterations in cell signaling can affect the cellular response to damage

Judgement and approach

- Process, analyze, evaluate experimental results in tumor biology and draw conclusions about the results based on published scientific research
- Evaluate and discuss new hypotheses in cancer research

Course content

The focus of the course is to gain in-depth knowledge of tumor development in general and how genetic changes form the basis of cancer in humans. Furthermore, the course provides an overview of different forms of cancer linked to both clinical and biological aspects as well as to the occurrence of specific gene changes.

• Organ-specific cancer: different aspects of malignancy linked to environmental factors, origin, sex, hormones and molecular biology
• Mechanisms behind tumor development, invasion and metastasis
• Concepts in cancer genetics including oncogenes, tumor suppressor genes, DNA repair genes and genes linked to apoptosis.
• Epigenetic regulation in cancer
• Control of the cell cycle and cancer
• Hormones and cancer
• Stem cells and cancer
• Tumor immunology and immunotherapy
• Principles of diagnosis and treatment of cancer
• Biomarker testing in cancer treatment
• Molecular methods to enable precision medicine

Teaching and working methods

At the Faculty of Medicine, student-centred and problem-based learning forms the basis of teaching. The student takes personal responsibility for the learning process through an active engagement to the learning tasks. The working methods challenge the students to independently formulate questions for learning, to seek knowledge and to assess and evaluate acquired knowledge in dialogue with others. Students work together in groups based on real-life situations to develop their own learning, contribute to fellow students' learning and to practice cooperation. The teacher's role is to support students in this way of working.

This course includes lectures, seminars, tutorial groups and laboratory work.

Examination

The course is examined through:

- An individual written exam.
- An individual written laboratory report
- Oral presentation at a seminar carried out in a group, with individual assessment.

Active participation in the compulsory parts is necessary to pass the course, and assessment is carried out continuously. Active participation includes that the student contributes with work and provides individual contributions and/or reflections with relevance to the learning tasks. Compulsory parts in this course are tutorial groups, seminars and laboratory work

The examinations may be completed an unlimited number of times by the students who did not achieve a passing result.The course is examined in English.

Grades

The grades for the course are fail, pass or pass with distinction. The final course grade is based on the grade from the written exam.

If special circumstances prevail, and if it is possible with consideration of the nature of the compulsory component, the examiner may decide to replace the compulsory component with another equivalent component.

Application for examination

Instructions on how to apply for examinations are given prior to the beginning of each course.

Re-examination

The date for re-examination should normally be announced by the date of the

regular examination at latest; in which case the scope must be the same as at the regular examination.

Examination for students with disabilities

If the LiU coordinator for students with disabilities has granted a student the right to an adapted examination for a written examination in an examination hall, the student has the right to it.

If the coordinator has recommended for the student an adapted examination or alternative form of examination, the examiner may grant this if the examiner assesses that it is possible, based on consideration of the course objectives.

An examiner may also decide that an adapted examination or alternative form of examination if the examiner assessed that special circumstances prevail, and the examiner assesses that it is possible while maintaining the objectives of the course.

Nomination of another examiner

A student who has taken two examinations in a course or a part of a course without obtaining a pass grade is entitled to the nomination of another examiner, unless there are special reasons to the contrary.

Grades

Three-grade scale, U, G, VG

Course literature

List of relevant literature is available at least 2 months prior to the start of the course as decided by the Department of Biomedical and Clinical Sciences (BKV). There is no mandatory literature in the course.

Other information

Planning and implementation of the course is to be based on the wordings in the course syllabus. A course evaluation is compulsory for each course and should include how the course is in agreement with the course syllabus. The course coordinator will analyse the course evaluation and propose appropriate development of the course. The analysis and proposal will be returned to the students, the Director of Studies, and as needed to the Education Board, if related to general development and improvement.

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

If the course is cancelled or undergoes major changes, examination is normally offered under this course syllabus, at a total of three occasions, within/in connection to the two following semesters, of which one in close proximity to the first examination.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.