



LUNDS UNIVERSITET
Medicinska fakulteten

Biomedical, medical and public health training
board (NBMFU)

COURSE SYLLABUS

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Valid from spring term 2011

BIMM51 Tumour Biology

15 higher education credits **Second cycle**

General Information

Main field

Biomedicine

Subject

Tumour biology

Type of course

The course is an optional advanced course in the Master of Medical Science programme in Biomedicine and is taught in term 2.

Language of instruction

English

Learning Outcomes

Knowledge and understanding

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

- at outline level describe standard terms used to describe the malignant process from normal cell to invasive cancer;
- at outline level describe the main groups of genes which can lead to cancer;
- describe with a terminology used in medical care the most common types of tumour, the most common types of hereditary cancer and the most commonly used types of treatment;
- explain with a scientifically correct terminology the molecular causes of the most common types of tumours;
- describe with a scientifically correct terminology the biology of the tumour cell;
- explain with a scientifically correct terminology how cancer-associated genes with different functions can collaborate in the genesis of cancer;
- explain with a scientifically correct terminology how the surrounding environment of the tumour cells and the immune system affect the progression of the tumour and which mechanisms lead to metastasis;
- explain the most-used experimental methods in cancer research at a level that allows their advantages and disadvantages to be assessed.

Skills and abilities

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

- independently acquire, critically review and translate new knowledge from scientific articles into a tumour

biological context

- present at seminar level compilations of original scientific papers within the subject field;
- carry out under supervision cell biology studies of tumour cells;
- use some bioinformatics methods to analyse tumour biology issues;
- independently propose experimental approaches for the study of basic problems of tumour biology;
- propose hypotheses with respect to the planning of experimental tumour biology examinations.

Judgment and approach

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

- demonstrate critical thinking, hypothesis formulation and logical analysis in the assessment and evaluation of tumour biology problems and issues at a level necessary for experimental medical science;
- reflect upon, and critically evaluate new findings and discuss ethical consequences of tumour biology research and knowledge in a manner acceptable at a scientific seminar within the subject field.

Course

Content

The course focuses on providing detailed knowledge of the molecular mechanisms that lead to the conversion of the normal cell into a tumour cell, but also includes the most important aspects of diagnosis and prognosis. It also describes, in overview, the different treatment strategies available.

Subjects dealt with during the course include: the genes that cause cancer and their normal function in the cell, cell cycle control and apoptosis, growth factors, signal transduction, transcription factors, tumour progression and metastasis, the interaction of the tumour cell with normal cells, angiogenesis, tumour virology, tumour immunology, radiotherapy, chemotherapy and its molecular mechanisms of action, heredity and cancer, etiology, cancer epidemiology and the ethical aspects of the diagnosis of hereditary cancer.

Subjects examined

Written examination 8 credits

Laboratory exercises 6 credits

Oral presentation 1 credit

Instruction and Examination

The lectures cover the key concepts of tumour biology with defined themes for each week of the course. Additionally, lectures deal with the most common types of tumour and their characteristics, the diagnosis of cancer, and tumour pathology.

Alongside the lectures, students carry out individual information collection and problem solving through independent study and supervised group discussions in the form of problem-based learning (PBL). In five different PBL exercises, students will deepen their knowledge of key issues of tumour biology.

Students carry out two week-long laboratory exercises that illustrate different aspects of tumour biology research. These laboratory sessions are designed to provide practical experience of laboratory work, at the same time as students will report their results in writing in the context of tumour biology. The laboratory exercises aim for students to use and evaluate important laboratory and bioinformatics methods within tumour biology. Additionally, a demonstration is carried out at a clinical pathology department.

The students will carry out an oral presentation of an original scientific paper. The papers illustrate specific issues in the field that are dealt with at outline level during the course's lectures and other stages. The aim is to train the ability to disseminate scientific information and assess the presentations of other students, to critically examine and discuss scientific work and gain greater insight into current laboratory techniques.

Examination takes place via a written examination consisting of two parts. One part consists of questions with short answers, which evaluate students' basic knowledge. The second part consists of essay questions which evaluate students' abilities to apply their collected basic knowledge of tumour biology to more complex issues. This requires the integration of various aspects of cell biology disorders that can lead to cancer.

Grades

The grades awarded are Pass or Fail.

Admission Requirements

Molecular medicine (BIMA51) or at least 120 credits in scientific subjects, which must include 15 credits of basic chemistry (any of the courses KEMA00, KEMA01, KEMA02, KEMA03), 15 credits of cell chemistry (MOBA02), and 15 credits of physiology (BIMA34 or BIOC01).

Literature

The Biology of Cancer by Robert Weinberg, Garland Science Textbooks.

Additional list literature will be listed separately. An updated list will be posted on the course website a month before the course starts. Scientific papers will be issued during the course.

Further Information

The course replaces the earlier BIM071. The course will be taught in Malmö.