Course syllabus for

Molecular Oncology and applied Biostatistics, 15 credits
Molekylär onkologi och tillämpad biostatistik, 15 hp

This course syllabus is valid from autumn 2016.
Please note that the course syllabus is available in the following versions:
Autumn2016, Autumn2017

Specific entry requirements
At least a grade of pass for the courses Introduction to Biomedical Science, General and Organic Chemistry, Medical Biochemistry, Cell Biology and Genetics, Integrative Physiology, Tissue Biology, and Biostatistics, as well as having passed the parts Laboratory work and seminars (4 credits), and Project work (3 credits) within the course Infection and Immunity, and having passed the parts Pharmacokinetics and pharmacodynamics (2 credits), Laboratory work in pharmacology (1.5 credits) and Group assignments in pharmacology and toxicology (2.5 credits) within the course Pharmacology and Toxicology, within the Bachelor's Programme in Biomedicine.

Objectives
After the course the students should be able to:

- describe general principles of cancer diagnostics and treatment,
- understand the basic processes underlying the transformation of a normal cell to its malignant counterpart, and the consequences of malignant transformation on the cellular and organism level,
- understand how the biological knowledge of cancer development is used in modern cancer
show knowledge and skills in laboratory techniques used in experimental cancer research,
demonstrate knowledge in cancer epidemiology,
use basic epidemiological research methods and describe their importance incomplementing other
(e.g., laboratory) research investigations,
use the principles of good experimental design to plan valid and efficient experimental studies,
have knowledge about and be able to discuss ethical aspects in research.

Content

Molecular oncology
Tumor biology: Causes of cancer. Cancer related genes, including oncogenes and tumor
suppressor genes; their normal cellular function, mutagenesis and consequences of their mutant state in
Cell cycle control and apoptosis. Tumor progression and metastasis. The interaction between malignant
and normal cells. Tumor virology. Research methodology.

Oncology
Malignant diseases. Diagnosis. Molecular tumor pathology. The major treatment principles of cancer
(surgery, radiotherapy, hormonal treatment, and biological therapy). Novel and developing treatment

Biostatistics
Study design: Randomized controlled trial, cross-sectional study, case-control study, cohort study.
Epidemiological concepts: confounding bias, selection bias, mediation, interaction.
Statistical models and methods: linear regression (with ANOVA), logistic regression, proportional
hazards regression.

The course is divided into the following parts:

Laboratory practicals, 5 hp

Problem based seminars and group seminars, 5 hp

Integration of molecular oncology and biostatistics, 5 hp
Summative written examination of the different components of the course.

Teaching methods

The teaching includes lectures, patient demonstrations, problem based seminars, group seminars and
laboratory practicals.

Examination

Laboratory practicals(5 credits). The examination consists of active participation. Graded Fail/Pass.

Problem based seminars and group seminars (5 credits). The examination consists of active
participation. Graded Fail/Pass.

Integration of molecular oncology and biostatistics (5 credits). The examination consists of a written
examination. Graded Fail/Pass/Pass with distinction.
The final grade for the whole course is based on the grade for the part Integration of molecular oncology and biostatistics. To pass the whole course, the grade pass must have been obtained for the other parts on the course.

Compulsory participation
Laborations, seminars, patient demonstrations and a written part exam covering the first parts of the course are compulsory. The course director decides if and how absence from compulsory components can be compensated. The component is not registered in LADOK unless the student has passed the compulsory component or compensated according to the course directors directions.

Limited number of examinations or practical training sessions
Students who have not passed the regular examination are entitled to participate in five more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided.

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 counted as an examination.

Transitional provisions
After each course occasion there will be at least six occasions for the examination within a two-year period from the end of the course..

Other directives
The course language is English.

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

Oral evaluation in the form of course council meetings will be carried out during the course.

Literature and other teaching aids

Mandatory literature
Weinberg, Robert A.
The biology of cancer
ISBN:9780815342205 (hft.) LIBRIS-ID:14608758
Library search