



## DEPARTMENT OF MICROBIOLOGY, TUMOR AND CELL BIOLOGY

### **C1F3024, Advanced Cancer Biology, 3 credits (hec)**

Avancerad cancerbiologi, 3 högskolepoäng

*Third-cycle level / Forskarnivå*

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#### **Approval**

This syllabus was approved by the The Committee for Doctoral Education on 2023-11-16, and was last revised on 2025-04-11. The revised course syllabus is valid from spring semester 2025.

#### ***Responsible department***

Department of Microbiology, Tumor and Cell Biology, Faculty of Medicine

#### **Prerequisite courses, or equivalent**

Basic course in tumour biology and oncology.

#### **Purpose & Intended learning outcomes**

##### **Purpose**

The course aims to provide advanced, cutting edge pre-clinical and clinical knowledge in the field of cancer biology.

##### **Intended learning outcomes**

At the end of the course the students should:

- Have acquired an updated overview of the cutting edge research activities within the fields of cell- and tumor biology.
- Be able to show analytical and critical thinking when discussion advanced problems in cell- and tumor biology, beyond what is found in text books, and evaluate the relevance of the topics presented in the context of their own research activities and PhD studies.
- Be able to discuss important aspects of tumor biology, including apoptosis, cell cycle, cancer stem cells, differentiation, virus and bacteria-associated cancer, tumor immunology and effects of chronic inflammation in carcinogenesis, cancer genetics and epigenetics, transcriptomics, proteomics and metabolomics of cancer, tumor microenvironment, angiogenesis, metastasis, tumor heterogeneity and development of new treatments as well as key issues in clinical cancer research.

## Course content

The lecturers will give a comprehensive and pedagogical overview of the research area as well as an in-depth discussion of their own research, related, but not limited, to the following topics: apoptosis, cell cycle, cancer stem cells, differentiation, virus and bacteria-associated cancer, tumor immunology and effects of chronic inflammation in carcinogenesis, cancer genetics and epigenetics, transcriptomics, proteomics and metabolomics of cancer, tumor microenvironment, angiogenesis, metastasis, tumor heterogeneity and development of new treatments as well as key issues in clinical cancer research

## Forms of teaching and learning

The course will consist of about 20 lectures, with approximately 45 minutes per lecture, at least once a week during one semester.

Each lecture will be followed by an open discussion between the students and the invited speaker led by one of the course organizers: this format will provide time for highlighting key issues within the specific topic and will enhance the possibility for the students to expand their networking activities due to direct contact with experts in the field.

To increase the learning process and to stimulate the reflection on the course topic, the students will be required to study the most recent literature, still not present in the text books within the presented fields, prior to each seminar. Throughout the course period, the course organisers will have regular meetings with the students to follow up the learning process of each individual participant as well as to receive feedback from the students.

### *Language of instruction*

The course is given in English

## Grading scale

Pass (G) /Fail (U)

## Compulsory components & forms of assessment

### Compulsory components

Attending the lectures and the written essay are compulsory. Missed seminars can be compensated by other activities after discussion with the course leader.

### Forms of assessment

The students have to show that the intended learning outcomes of the course are reached. This will be individually assessed during the participation in the informal discussions after the seminars and on the basis an individual written assessment, in form of a project description where one or more topics presented during the course should be integrated within the student own research project (Max one and half A4 page, stating: the objective of the project, a brief description of the research plan, and the significance). The project description should be handed in maximum three weeks after the completion of the course to the organizers.

## Course literature

1. Weinberg, Robert A. The biology of cancer. Garland Science, Taylor and Francis group, 2007, selected parts
2. Scientific papers and/or review articles discussing recent advance in the topics presented