



DEPARTMENT OF MICROBIOLOGY, TUMOR AND CELL BIOLOGY

C1F3076 Cancer Cell Metabolism, 1.5 credits (hec)

Cancercellens metabolism, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus is approved by the The Committee for Doctoral Education on 2023-11-23, and is valid from Spring semester 2024.

Responsible department

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

Prerequisite courses, or equivalent

Basic knowledge in Tumor Cell Biology

Purpose & Intended learning outcomes

Purpose

The course provides an introduction to cancer cell metabolism. Focus is on the roles of oncogenic signaling and tumor microenvironment as drivers of tumor development and progression. Therapeutic and diagnostic perspectives exploiting the altered cancer metabolism are discussed.

Intended learning outcomes

After the course, the student should be able to:

- describe and explain the role of altered cellular metabolism in cancer development and cancer progression;
- reflect upon the interaction between oncogenic signaling and tumor metabolism;
- discuss how tumor metabolism may be exploited in anticancer therapies and diagnosis/prognosis.

Course content

Overview about cell metabolism

The major metabolic pathways
 The mitochondrion
 Signalling pathways and metabolic control
 Cancer cell metabolism
 Methods to study cell metabolism
 Targeting metabolism for cancer treatment

Forms of teaching and learning

The course consists of lectures with invited national and international scientists with focus on Cancer cell Metabolism. The students will actively talk to the scientists in the "Meet the Scientists" format and discuss the topics during beehive discussions. The course is given full-time during 1 week. The teaching is mainly in lecture/seminar form and also includes project work. This project is presented orally on the last day of the course. The project work requires studies of a specific topic in Cancer Cell Metabolism.

Language of instruction

The course is given in English.

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

Attendance at lectures is strongly advised. Participation in the beehive and "Meet the scientists" session is mandatory. To compensate for absence due to e.g. illness the student may be required to write a report and/or discuss the missed subject with the course leaders.

Forms of assessment

Examination is divided into two parts: Firstly, during active participation in the "Meet the scientists" seminar and in connection with the beehive group discussion. Secondly, the students will be given an assignment to be presented on the last day of the course. This assignment is a short project proposal within one topic chosen from a list of 10. The proposal will contain an overview of the field which motivates a specific research question identified by the student/s and a brief work plan that explains how the question/hypothesis can be solved/investigated.

Course literature

Literature suggestions will be made by the lecturers during the course. In addition, this is a list of suggested literature Cairns RA, Harris IS, Mak T. Regulation of cancer cell metabolism. Nat Rev Cancer 2011 Schulze A and Harris AL. How cancer metabolism is tuned for proliferation and vulnerable to disruption. Nature 2012 Ward PS, Thompson CB. Metabolic Reprogramming: A Cancer Hallmark Even Warburg Did Not Anticipate. Cancer Cell 2012 Galluzzi L, Kepp O, Vander Heiden MG, Kroemer G. Metabolic targets for cancer therapy.

Nat Rev Drug Discov 2013 Parks SK, Chiche J, Pouyssegur J. Disrupting proton dynamics and energy metabolism for cancer therapy. Nat Rev Cancer 2013