DEPARTMENT OF ENVIRONMENTAL MEDICINE

C6F3127 Human Cell Culture. Methods and Applications, 1.5 credits (hec)

Odling av celler från människa. Metoder och tillämpningar, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus is approved by the The Committee for Doctoral Education on 2023-11-27, and is valid from Spring semester 2024.

Responsible department
Department of Environmental Medicine, Faculty of Medicine

Prerequisite courses, or equivalent

No prerequisite courses, or equivalent, demanded for this course.

Purpose & Intended learning outcomes

Purpose

The purpose of the course is to enable doctoral students to acquire state-of-the art knowledge and good understanding of human cell culture.

Intended learning outcomes

After the course the students should be able to:
- Describe the theory and give examples of practical applications of human cell culture.
- Explain basic and state-of-the-art methods applied to cell cultures.
- Discuss possibilities and challenges in cell culture work.

Course content

Cell culture reflecting stem, transit amplifying, differentiated and terminally differentiated tissue states. Monolayer and organotypic culture involving one or more cell types. Applicability of cell

cultures as alternatives to laboratory animal experiments. Mechanisms regulating cell growth and viability, differentiation and apoptosis. Assessment of cell transformation to immortal and malignant phenotypes. Isolation of specific cells, e.g., epithelial cells, characterisation of cultured cells. Handling and sterile techniques, choice of materials and media for cell culture, e.g., serum-dependent vs. serum-free culture conditions. Cell cloning and gene transfer. Practical handling of cultures: thawing/freezing, passage, expansion and long-term storage. Handling of normal and tumor tissue for optimizing obtainment of cultures. High-throughput screening technologies. Tissue engineering practices. Transcriptomics, proteomics and informatics methods for biomedical research with cell lines. Discussion of participants' own culture experience and problems.

Forms of teaching and learning

Interactive lectures, laboratory work, computer exercises and group discussions on pitfalls and possibilities with cell cultures.

Language of instruction
The course is given in English.

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

Participation in interactive lectures, group discussions, laboratory work and oral examination is compulsory. Absence from compulsory elements can compensated by participation at the next course occasion.

Forms of assessment

Examination is in the form of a written assignment and oral presentation.

Course literature

Handouts are provided for all elements of the course.