Level: master

Course title: Cell culture in biochemistry (IB-508)

Status: elective

ECTS: 5

Requirements: none

Learning objectives

The goal of the course is to provide students with theoretical knowledge and practical skills in animal cell lines maintaining and their applications in the examination of mechanisms of biochemical processes, as well as the biological activities of isolated and synthesized products. Furthermore, the goal of the course is to develop student's ability to independently select the appropriate method and cell culture as a biological substrate for examining the biochemical mechanisms and biological potential of the selected substrates.

Learning outcomes

Upon successful competition of the course student should be able to: (1) understand the use of different animal cell lines in biochemical research, (2) show creativity in selecting methods and cell lines as a biological substrate for the examination of the biological mechanisms and potential of isolated and synthesized products (3) make their own conclusions about the possible mechanisms of investigated biological process, or action of isolated and synthesized products in corresponding biological process, depending on the results of experiments in which they used different cell lines as a substrate, (4) recognize laboratory equipment and techniques used for cell cultures maintaining, (5) independently apply the appropriate experimental procedures during work with cell cultures, (6) independently process data, critically present the results and conclude.

Syllabus

Theoretical instruction:

The main types of animal cell cultures. Laboratory equipment for animal cell cultures maintaining. Aseptic techniques practised in laboratory for cell culture. Types and selection of culture media for growing cells. Cell lines contamination. Basic methods in cell cultures maintaining: subculturing, isolation, counting, determination of cell viability and cell preservation (cryopreservation). Characterisation, transformation, cloning and selection of cell lines. The principle of selecting the appropriate cell lines for bioassays. Investigation of the effect of natural products and synthesised compounds on growth, proliferation, metabolism and apoptosis of cell lines. Methods for monitoring cell responses. Selected examples of *in vitro* methods based on cell cultures as a biological substrate.

Practical instruction:

Introduction to the laboratory for cell cultures and aseptic techniques. Subculturing, isolation, counting, determination of cell viability and cell preservation (cryopreservation). Cell cultures maintaining. Monitoring the cytotoxicity of selected plant extracts, isolated and synthesized compounds on the selected cell line.

Weekly teaching load				Other: /
Lectures: 2	Exercises: 2	Other forms of teaching: /	Student research: /	