Temat zajęć:

Czy terapia naprawdę działa? Jak badać odpowiedź na leczenie

Proponowane daty, godziny oraz miejsce realizacji zajęć:

15-18.03.2027, 13:00- 16:45 (5 godzin dydaktycznych dziennie);; termin do ustalenia. Zajęcia prowadzone zdalnie za pośrednictwem platformy Microsoft Teams.

Forma zajęć:

zdalna

Profil zajęć:

kliniczny / molekularny / interdyscyplinarny

Dyscyplina naukowa:

nauki medyczne , nauki o zdrowiu

Imię i nazwisko koordynatora zajęć:

dr hab. Katarzyna Sobierajska, prof. UMed

Jednostka organizacyjna odpowiedzialna za przeprowadzenie zajęć:

Zakład Molekularnych Mechanizmów Komórkowych, Uniwersytet Medyczny w Łodzi

Dane kontaktowe jednostki organizacyjnej:

Mazowiecka 6/8, p 150

Limit liczby uczestników:

minimum 10 osób

Czas trwania zajęć:

20 godzin – 4 × 5 godzin

Syllabus

Title:

Does the Treatment Really Work? How to Study Therapeutic Response

Course description:

The course offers a practical approach to experimentally assessing therapeutic response. It addresses a fundamental problem in biomedical research: what evidence is required to conclude that a treatment has an effect, and how can its mechanism of action be investigated?

Using experimental examples, participants will follow the successive stages of treatment-response assessment, from selecting an experimental model and determining dose and exposure time to measuring viability, proliferation, cell death, molecular response and cellular function. Particular attention will be paid to the interpretation of apparently contradictory results and to the distinction between cytotoxic, cytostatic and functional effects.

The course combines short theoretical introductions with demonstrations, experimental data analysis and problem-solving exercises.

Course outline:

Day 1 – What does it mean that a treatment works? (5 h)

Selection of experimental models and controls; concentration and exposure time; dose-response relationships; selection of experimental endpoints. Participants design a basic experiment to assess the effect of a selected treatment and compare alternative experimental strategies.

Day 2 – Is the cell dead, alive or simply no longer proliferating? (5 h)

Practical interpretation of viability, proliferation and cell-death assays. Metabolic assays, cell counting, fluorescence-based assays and flow cytometry. Participants analyse datasets in which different methods provide apparently inconsistent results and determine possible biological explanations.

Day 3 – From molecular response to functional effect (5 h)

Demonstrations and interpretation of Western blotting, fluorescence microscopy and flow cytometry results. Functional assessment of cellular response using adhesion, migration, wound-healing and invasion assays. Participants determine whether biologically relevant functional effects accompany observed molecular changes.

Day 4 – Does the evidence demonstrate therapeutic activity? (5 h)

Integrated analysis of experimental cases. Participants receive dose-response data, viability and proliferation results, microscopy images, protein analyses and functional assay results. They determine whether the available evidence supports therapeutic activity, propose possible mechanisms and design the next experiment required to verify their conclusions.

Learning outcomes:

After completion of the course, participants will be able to design an experimental strategy for assessment of treatment response, select appropriate experimental models, controls and endpoints, distinguish cytotoxic from cytostatic effects, select and interpret methods used to assess viability, proliferation and cell death, relate molecular changes to cellular function, critically analyse apparently contradictory experimental results and propose experiments required to investigate mechanisms of therapeutic response.

Teaching methods:

Short interactive introductions, demonstrations of experimental procedures, analysis of raw and processed experimental data, case studies, problem-solving exercises and group discussion.