The Hebrew University of Jerusalem

Syllabus

Signalling pathways and targeted therapy in cancer - 94693

Last update 17-08-2020

HU Credits: 4

Degree/Cycle: 2nd degree (Master)

Responsible Department: Bio-Medical Sciences

Academic year: 0

Semester: 1st Semester

Teaching Languages: English

Campus: Ein Karem

Course/Module Coordinator: Prof. Ittai Ben-Porath

Coordinator Email: ittaibp@mail.huji.ac.il

Coordinator Office Hours: By e-mail coordination

Teaching Staff:
Prof Ittai Ben-Porath,
Prof Yinon Ben-Neriah,
Prof Rotem Karni

Course/Module description:
Signaling pathways play a central role in regulating cell function and division, and are the most important tools used by cells to communicate with their environment and respond to it. Malfunction of signaling pathways occurs in almost every type of cancer, and drives disease development. Accordingly in recent years new drugs have developed that target specific pathways in order to block aberrant signals. The course discusses the mechanisms of action of central signaling pathways controlling cell growth, viability, division and differentiation, and the manner by which these change to drive cancer. The course will also discuss the therapeutic approaches that are in development for combating aberrant signaling in cancer.

Course/Module aims:

Learning outcomes - On successful completion of this module, students should be able to:
Students will acquire a broad knowledge of the mechanisms of action of signaling pathways, their malfunction in cancer, and the manners by which novel therapies target these pathways. Students will also gain exposure to cutting-edge research studies in the field, tools to analyze such studies, and an opportunity to present these works.

Attendance requirements(%):
80%

Teaching arrangement and method of instruction:

Course/Module Content:
Introduction to cancer and its causes

Principles of signaling

From receptor to nucleus: central signaling pathways controlling cell proliferation and viability

Regulation of cell growth – the mTOR pathway

Targeted therapies – development and targets

From cellular stress and damage to response: regulation of the cell cycle, apoptosis and senescence

Cancer and differentiation pathways, stem cells and cancer

The tumor microenvironment – pathways controlling angiogenesis and stromal support

Inflammation and cancer

Immune cell interaction of tumors and their therapeutic targeting

Transcriptional regulators driving cancer and their inhibition

A global view of signaling malfunction in cancer through genomic analyses

Required Reading:
Students will be directed during the course to journal papers and textbooks.

Additional Reading Material:

Course/Module evaluation:
End of year written/oral examination 70 %
Presentation 30 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
The course is open to Masters students in Biomedical Studies and in Biology. Doctoral students are invited, taking into account faculty credit rules.

Comment for COVID-19 period: should teaching be conducted online only, the final grade will be determined according to student seminar (80%) and participation in lessons (20%)