UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Oncologia Molecolare e Cellulare

2122-1-F0601Q083

Aims

The main objective of this course is to convey the fundamental principles of oncology and experimental oncology through the critical revision of a selection of seminal publications in the field. We will focus on the different experimental strategies used, with particular emphasis on genetics and reverse genetics approaches. The aim is to provide the students with all the critical tools and the knowledge required for a deep understanding of modern Molecular Oncology.

Knowledge and understanding: to convey basic knowledge in the field of Experimental Oncology

Applying knowledge and understanding: to teach how to evaluate critical issues related the study of Oncology

Making judgments: to provide guidelines on how to critically evaluate Oncological Studies

Communication skills: to provide guidelines for clear, concise and rational communications

Learning skills: to promote problem solving and critical thinking.

Contents

Overview of the main principles in Oncology
Oncogenes and Tumor Suppressors
Mechanisms of tumor suppression
The role of Senescence and Apoptosis in cancer therapy
Re-activation of tumor suppressive responses in established tumors
Genetic and Genomic instability as a hallmark of Cancer

Role of telomeres and telomerase in Cancer progression
Stem Cells and Cancer Stem Cells
Cancer genomics

Detailed program

Overview of the main principles in Oncology
The hallmarks of Cancer
Cancer is a Genetic disease
General principles in experimental Oncology
Oncogenes: identification and properties
Pathways mutated in Cancer
Experimental strategies in Molecular Oncology
The Myc oncongene

Oncogenes and Tumor Suppressors
Mechanism on Oncogenic transformation
Oncogene Addiction
Tumor Dormancy
Tumor suppressive responses
Mechanisms of tumor suppression
p53 and pRb in tumor suppression

The role of Senescence and Apoptosis in cancer therapy
Preclinical models of Cancer
Chemotherapy outcome depends on the genetic make-up of cancer cells

Re-activation of tumor suppressive responses in established tumors

Genetic and Genomic instability as a hallmark of Cancer
The DNA Damage Response (DDR)
The DNA Damage Response is a tumor suppressive mechanism
Genetic analysis of components of the DDR and their role in tumor progression

Role of telomeres and telomerase in Cancer progression

Stem Cells and Cancer Stem Cells
The hematopoietic Stem Cells
The concept of Cancer Stem Cells

Cancer genomics

Prerequisites

None

Teaching form

Lecture

Textbook and teaching resource

Riferimenti bibliografici verranno indicati duranti il corso. La lista completa e copia del materiale didattico (slides) è reperibile presso il sito e-learning.

Semester

Second semester

Assessment method

In the first part, the student will present and critically evaluate a scientific article assigned by the Teacher (see below for instructions). In the second part, the student will be required to answer to questions concerning the different topics of this course.
Instructions for the assignment of the scientific article to be discussed during the examination:
The student is kindly requested to contact the teacher three/four weeks in advance for the assignment of the paper.
The student will have to bring a hard copy of the manuscript devoid of any annotation.
The teacher can be contacted by e-mail at the following addresses:
stefano.campaner@unimib.it
stefano.campaner@iit.it

Office hours

On demand, by email