UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Translational Approach To Onco-Hematological Diseases

2425-2-F0901D048

Aims

The aims of the course will be as follows.

1. Stem cell biology; hemopoietic stem cell transplantation as the best success of stem cell therapy. Cell therapy and regenerative medicine.
2. Cell therapy in cancer, from discovery to application in the clinic.
3. Monoclonal antibodies: from Koehler & Milstein up to now, a masterpiece in biotech therapy.
4. Introduction to gene therapy; the viral and non-viral vectors; successes and challenges in gene therapy.
5. The concept of ”Good Manifacturing Practices, GMP”: how cellular or gene therapy products (es. CAR-T cells) become a drug.
6. Use of TKIs in differente neoplastic diseases
7. Mechanisms of resistance to TKIs
8. Methods to identify and analyze genetic lesions causally connected to the transformed phenotype
9. DNA and Histone methylation as therapeutic targets
10. The RNA interference targeting strategy
11. High Throughput Sequencing applied to neoplastic diseases

Contents

The course aims to provide students with a review of selected topics relating to the most relevant biotechnological applications resulting in innovative therapies in the oncology-hematology field. The main pillars consist of the description of the development of therapies with somatic and/or genetically modified cells, molecular therapies and targeting strategies using "small molecules". Furthermore, students will be able to learn the importance of the relationship between targets and neoplastic transformation.

Detailed program

The extended course program is contained in the individual modules of Cell and Gene Therapy and Molecular and Oncological Therapy.

Prerequisites

Basic knowledge in pathology and immunology. Advanced knowledge in biochemistry, molecular biology and genetics.

Teaching form

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In-person learning and interactive lessons.
The course is divided into 12 in-person learning lessons of 2 hours each and 4 in-person interactive lessons of 2 hours each for the Cellular and Gene Therapy Course and into 6 in-person learning lessons of 2 hours each and 2 in-person interactive lessons of 2 hours each for the Molecular and Oncological Therapy Course.

Textbook and teaching resource

For each topic, updated reviews will be indicated in class on which to orient your study.
Some relevant publications and slides (in PDF format) of the lessons will be uploaded on the course page.

Semester

First semester

Assessment method

Written exam: two open-ended questions (a question related to the Cellular and Gene Therapy Course and a question related to the Molecular and Oncological Therapy Course).
Final oral exam (in English) with the presentation and the discussion of a scientific article.

Office hours

Make an appointment by email to the teacher (email address: marta.serafini@unimib.it and rocco.piazza@unimib.it)

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING