UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Functional Genomics

2223-1-F0901D040

Aims

The aims of the Course are to provide the student with up to date knowledge of technics instruments and strategies normally employed in post-genomics, focusing on genome sequences functions, interactions and mechanisms regulating their expression.

Contents

Chromatin and human genome organization; Expression and gene regulation; Epigenetics; Developmental genetics; Mutations, DNA repair and genetic variability; Mapping of variants and diseases genes; Evolutionary and population genetics.

The Human Genome Project and subsequent technological developments are to be considered an indispensable tool for understanding study strategies.

Detailed program

Organization of the human genome - Chromosome structure and function - Model Organisms, comparative genomics and evolution - Sequencing genomes - Identifying and analysis of the functional components of the genomes - Human gene expression - Epigenetics - noncoding RNAs - Next generation sequencing - Single cell analysis - Genetic variability and its consequences - Studying gene expression and function models: • in vitro models: cell lines, primary lines, stem cells and reprogramming • expression vectors, plasmidic and viral, and their use for the study of protein-protein DNA-protein interaction, and possible therapeutic applications • gene targeting, gene editing, post-transcriptional modifications for the knock-out or downregulation of genes.

Prerequisites

Advanced knowledge in genetics, biology and molecular biology.

Teaching form

Classroom lessons.

The lessons will consist in formal lectures and discussions of original scientific articles on topics related to the course.

In the event of a health emergency, the method of delivery of the teaching activity will be changed (videoconferences)

Textbook and teaching resource

-ppt

videoconferences (Webex)

-Review and articles published in international journals will be indicated during the course.

-Genetica e Genomica nelle scienze mediche; T. Strachan, J. Goodship, P. Chinnery. Prima Edizione Italiana - Zanichelli

-Epigenetics; L. Armstrong. Garland Science

Semester

I Semester

Assessment method

The assessment of the profit will take place in the scheduled exam sessions, through a written exam consisting of multiple choice quizzes, concerning the entire program, for the evaluation of the student's general preparation, and an open question chosen by the student among three different questions proposed, to evaluate the ability to understand and deepen. During the course, students will also be required to make an oral presentation on a topic of their choice relevant to the program, to evaluate presentation and synthesis skills. The final evaluation will be given by the average of the three verifications.

In the event of a health emergency, the exams will be only in oral form

Office hours

on appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY