



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Genomica Funzionale

2122-1-F0901D040

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#### 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

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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**

Written and oral exam.

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

## **Office hours**

on appointment

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