UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Molecular Biology

2425-1-H4601D066-H4601D011M

Aims

MOLECULAR BIOLOGY knowledge of the main concepts of molecular biology, with particular regard to the processes of DNA replication and control of gene expression.

Contents

Structure and function of the most important cellular macromolecules; transcription and RNA processing; pathological implications. molecular biology techniques used in research and in molecular diagnostics.

Detailed program

Chemical composition and molecular organization of the cell – water, carbohydrates, lipids, proteins and nucleic acids. Identification of the chemical compound carrying the genetic information – Molecular basis of inheritance – DNA replication. Telomerases – Mechanisms of DNA repair. Correlation with human diseases, aging and cancer. - RNA, structure and function – Transcription and RNA maturation – The genetic code, and its biological implication (redundancy, frameshift). - Molecular genetic tools (restriction enzymes, vectors, Southern blotting, PCR, sequencing, microarrays). Molecular cloning. Strategies for the diagnosis of genetic diseases (direct and indirect) – The human genome project: future implications – Gene therapy: general concepts and applications.

Prerequisites

Aims of the course Scienze Propedeutiche

Teaching form

15 2 hours-lectures composed by:

- a section of delivered didactics (Didattica erogativa, DE) focused on the presentation-illustration of contents by the lecturer.
- a section of interactive teaching (Didattica Interattiva, DI) including teaching interventions supplementary to delivered didactic activities, practical applications and in itinere test

Didactic activities are conveyed by means of face-to-face lectures

Textbook and teaching resource

Main Textbook

TESTO UNICO PER BIOLOGIA E GENETICA:

G. De Leo, E. Ginelli, S. Fasano. Biologia e Genetica EdiSES, 2020

More resources

- H.Lodish, A. Berk, S.L. Zipursky, P. Matsudaira, D. Baltimore, J. Darnell. Molecular cell biology, Ed. FREEMAN, 9. ed. del 2021
- G. Karp. Biologia cellulare e molecolare 3°ed EDISES, 2021
- Strachan.Genetica Molecolare Umana, Zanichelli 2021
- P.J.Russell. Elementi di Genetica, 2 edizione Edises 2016

B. A. Pierce. Genetica. 2 edizione ZANICHELLI, 2016

ppt slides from frontal lectures

Semester

2° semester

Assessment method

One exam for all three sections of the course. Written test multiple choices (around 30) and 2-3 open shorts questions on all three modules. The examination is intended to test students' knowledge acquired in the different modules of the course.

Office hours

On appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING