UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Molecular Biology

2122-1-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). - Immunogenetics. Generation of antibody diversity - Cancer genetics. Oncogenes and tumor suppressor genes (Rb1, WT1 and p53) – 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

Frontal lectures

Textbook and teaching resource

Main Textbook

G. De Leo, E. Ginelli, S. Fasano. Biologia e Genetica EdiSES, 2013

More Resources

- H. Lodish, A. Berk, S.L. Zipursky, P. Matsudaira, D. Baltimore, J. Darnell. Molecular cell biology, Ed. FREEMAN, 6° ed. 2007.

- G. Karp. Biologia cellulare e molecolare 3° ed EDISES, 2007

- Strachan. Human molecular genetics, 4° Ed. GARLAND SCIENCE, 2010

- P.J. Russell. Genetica. 2° ed EDISES, 2007

- B. A. Pierce. Genetica. ZANICHELLI, 2005.

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