



MOLECULAR BIOLOGY

Enrollment year	2019/2020
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/11 (MOLECULAR BIOLOGY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOLOGICAL SCIENCES
Curriculum	PERCORSO COMUNE
Year of study	3°
Period	1st semester (01/10/2021 - 14/01/2022)
ECTS	9
Lesson hours	72 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	NERGADZE SOLOMON (titolare) - 3 ECTS GIULOTTO ELENA - 6 ECTS
Prerequisites	Passing the Genetics exam is required. A good knowledge of basic Biochemistry is also required.
Learning outcomes	Students will reach a basic knowledge of the main subjects in molecular biology and will learn the main methods with particular attention to recombinant DNA technology. Through specific examples, students will learn the experimental procedures that led to the most relevant discoveries in the field.
Course contents	Structure of nucleic acids. DNA replication: general mechanism, proteins involved in replication of procaryotes and eukaryotes, replication origins, telomeres and telomerase. Recombinant DNA technology: restriction endonucleases, molecular

cloning (vectors, libraries, examples of cloning strategies), DNA sequencing, PCR, site-specific mutagenesis.
 Transcription and regulation of gene expression in bacteria and in eukaryotes, transcription factors, maturation of mRNA in eukaryotes, alternative splicing, chromatin organization and gene expression.
 DNA damage, mutation and DNA repair: direct damage reversal, excision repair, mismatch repair, double strand break repair.
 Recombination: homologous, site-specific, illegitimate.
 Transposition: DNA transposons, retrotransposons, role of transposons in evolution.
 Genome organization.
 Molecular biology of cancer cells; mutations and cancer, oncogenes, mechanisms of oncogene activation, onco-suppressor genes, sporadic and hereditary tumours, applications of molecular biology to prevention, diagnosis and cure of cancer.

Teaching methods

The course comprises lectures during which the interaction between students and teacher is stimulated by questions of the teacher. At the end of each lecture the teacher answers to student questions. The slides shown during classes are distributed to the students through KIRO.

Reccomended or required readings

=- Amaldi F, Benedetti P, Pesole G, Plevani P.
 Biologia Molecolare, seconda edizione
 Casa Editrice Ambrosiana
 - Cooper GM, Hausmann RE
 La cellula un approccio molecolare, terza edizione italiana
 Piccin
 - Lewin B, Krebs JE, Goldstein E, Kulpatrick ST
 Il gene, seconda edizione italiana compatta
 Zanichelli

Assessment methods

Written exam with open questions and multiple choice questions. During the course a test in progress is carried out. In addition, students are required to fill anonymous questionnaires to test their preparation.

Further information

Written exam with open questions and multiple choice questions. During the course a test in progress is carried out. In addition, students are required to fill anonymous questionnaires to test their preparation.

Sustainable development goals - Agenda 2030

[The goals](#)