



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2022/2023		
MASTER'S DEGREE (MSC)	CHEMISTRY AND PHARMACEUTICAL TECHNOLOGIES		
SUBJECT	MOLECULAR BIOLOGY		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50322-Discipline Biologiche e Farmacologiche		
CODE	01639		
SCIENTIFIC SECTOR(S)	BIO/11		
HEAD PROFESSOR(S)	NOTARO ANTONIETTA	Ricercatore a tempo determinato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	102		
COURSE ACTIVITY (Hrs)	48		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS			

DOCENTE: Prof.ssa ANTONIETTA NOTARO

PREREQUISITES	knowledge of cell biology
LEARNING OUTCOMES	Knowledge and ability 'of understanding The student will acquire' knowledge of the biochemical informational molecules, DNA and RNA, both from the structural point of view that functional. Capacity 'to apply knowledge and understanding The student will be' able to apply the knowledge of the molecular processes of replication, gene transcription and protein synthesis for the understanding of the action of drugs whose mechanism of action and 'connected to biochemistry of informational molecules. Making judgments The student will acquire 'the capacity' to integrate the knowledge of the molecular processes of the cell with biochemical and pharmacological issues. Enable 'communication The student must' be able to present general concepts of biomolecular nature in simple terms, and also include a d a non-expert public. Capacity 'Learning The student must' be able to update itself by reading and study of scientific publications dealing with issues related to molecular and cellular biology.
ASSESSMENT METHODS	The student is evaluated through one oral examination. The assessment is carried out of thirty. He/she must answer at least three/four questions covering all aspect of the program. The oral examination tends to evaluate whether the student has developed knowledge, understanding and the ability to integrate the topics within the program. The threshold of sufficiency (18/30) will be achieved if the student shows knowledge and understanding of the topics at least in general terms and to be able to operate minimal links between them with sufficient communicative skills. Below this threshold the exam will be unsatisfactory and student will not pass it. On the contrary, the more the student will interact with the examining board with better expositive skill and deeper knowledge, the more the evaluation will be positive. The student who will demonstrate not only the excellent knowledge of the subjects, but also the ability to apply knowledge gained in different contexts to those of teaching, will reach the maximum of the evaluation (30/30 and praise).
EDUCATIONAL OBJECTIVES	The educational goal of the Molecular Biology course is to deepen the knowledge of duplication and transcription, of genetic information mechanisms, of protein synthesis, cell cycle and apoptosis. This knowledge is essential in the formation of a degree in chemistry and pharmaceutical technology to the study and understanding of the biological activity of drugs, especially anti-tumor purpose.
TEACHING METHODS	Frontal lessons, practice
SUGGESTED BIBLIOGRAPHY	Watson James et al. Biologia molecolare del gene. Ottava edizione. Ed. Zanichelli. ISBN: 978880852016-6 Amaldi F. et al. Biologia Molecolare. Terza Edizione. Casa Editrice Ambrosiana (C.E.A) ISBN: 9788808185181

SYLLABUS

Hrs	Frontal teaching
6	The nucleus and its molecular components: the structure of DNA; structure and function of histone and non-histone proteins. Organization of chromatin in the cell nucleus. DNA highly, on average, and not repetitive. Organization of the eukaryotic genome. Transposition
12	The decoding of genetic information: RNA and protein. Transcription and RNA maturation. Changes in the structure of chromatin during transcription. The regulation of transcription in eukaryotes mRNA. Post-transcriptional regulation: snRNA and microRNA.
6	The replication of DNA. The Pol of eukaryotes. The replication factors and PCNA. The eukaryotic replicons and the regulation of replication. Telomeres and telomerase
4	The cell cycle and its regulation. The cyclin-dependent kinases and their role in the cycle progression.
4	Apoptosis: the extrinsic pathway and intrinseca. Caspasi initiators and executors. The proteins of the Bcl2 family and the permeability of the outer mitochondrial membrane in the programmed cell death mechanism.
4	Interaction among mRNA, tRNA and rRNA during the protein synthesis. Protein synthesis processing and regulation.
4	Genetic code
Hrs	Practice
12	Laboratory practice about basic molecular biology techniques (extraction and dosage of nucleic acids; electrophoresis of nucleic acids. PCR)