



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2021/2022		
MASTER'S DEGREE (MSC)	MOLECULAR AND HEALTH BIOLOGY		
SUBJECT	CELL BIOLOGY		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50506-Discipline del settore biodiversità e ambiente		
CODE	01597		
SCIENTIFIC SECTOR(S)	BIO/06		
HEAD PROFESSOR(S)	GERACI FABIANA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	102		
COURSE ACTIVITY (Hrs)	48		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	GERACI FABIANA Monday 15:00 16:00 Studio docente. Ricevimento da fissare previo contatto per mail.		

DOCENTE: Prof.ssa FABIANA GERACI

PREREQUISITES	Basic Citology knowledges
LEARNING OUTCOMES	<p>-Knowledge and understanding Aim of the course is to provide graduates an advanced knowledge of the mechanisms of cell-cell and cell-matrix communication both under physiological and pathological conditions. They will also learn how to approach original papers in cellular biology field. Ability to use appropriate language.</p> <p>-Ability to apply knowledge and understanding Students will apply their knowledge on import and export mechanisms, on stem cell and extracellular vesicle use in regenerative medicine.</p> <p>-Independence of opinion Students of the Cellular Biology course will be able to independently evaluate experimental data in original paper on cellular and molecular biology.</p> <p>-Communication skills Students will acquire specific communicative skills of course topics, using an appropriate scientific language.</p> <p>-Learning capacity Students will be able to use PubMed to consult bibliographic material to upgrade their skills</p>
ASSESSMENT METHODS	<p>The examination includes an obligatory "in itinere" evaluation represented by the discussion of a paper, with a particular attention of experimental methods used by the authors. The duration of this test is about 10 minutes. This seminar has to take place during the lesson period. Students can also present the paper in group. This proof is not given a rating but only a judgment. This test is used to evaluate the student's ability to search for experimental works in database and understand how the authors have come to certain conclusions.</p> <p>In addition, the final exam include an oral examination on the topics explained during the course. The minimum number of questions is five, regarding the various part of the programme. The questions have to verify: the acquired knowledge, the computing capacity and possession of adequate exhibition capacity. The final assessment will be out of thirty (20% of the final grade will depend on the seminar), articulated as follows: Excellent: 30-30 laude; very good: 27-29; Good: 24-26; discreet: 21-23; sufficient: 18-20.</p>
EDUCATIONAL OBJECTIVES	Cell biology course aims to provide students with an advanced level of knowledge regarding the structural and functional organization of the cell, with emphasis on molecules involved in cell communication and interaction with the extracellular matrix. It will be also evaluated the role of bioactive molecules, mRNA and miRNA released through extracellular vesicles in processes of cell differentiation and signalling. We will also provide knowledge about stem cells and their use in regenerative medicine and the role of extracellular vesicles in this area.
TEACHING METHODS	Lectures and student seminars
SUGGESTED BIBLIOGRAPHY	<ul style="list-style-type: none">• Biologia Molecolare della Cellula, Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter. Zanichelli. Sesta edizione ISBN: 9788808621269.• Biologia Cellulare e Molecolare concetti ed esperimenti, Gerald Karp. Edises. Sesta edizione ISBN: 9788836230259• Molecular Cell Biology, 8 ed by Lodish, Berk, Kaiser, Krieger, Bretscher, Ploegh, Amon, Martin. ISBN 978-1319067748

SYLLABUS

Hrs	Frontal teaching
1	Introduction on cell structure and its components. PubMed use.
2	Basics of cytology and insights on the structure and function of the plasma membrane: lipid composition, membrane proteins, rafts, caveolae.
4	Endoplasmic reticulum (ER): functional and structural organization. Its role in protein biosynthesis. SRO,translocone. Co-traslational and post-traslational translocational. quality control in ER. ERAD pathway. ER exit sites. Intracellular calcium level regulation. Membrane dynamic.
4	Detailed studies on nuclear envelope: function and structure. Pore complex: organization and composition. Nuclear localization signal:canonical and non canonical import and export. Ran GDP-GTP. Traces on nuclear lamina and its involvement in pathology..
5	Endocytotic and exocytotic pathways: COPI, COPPII and clathrin coated vesicles. Rab proteins. Hypotheses on mechanisms for envelope removing
3	Golgi apparatus: organization. Golgins. Golgi during mitosis. Golgi apparatus functions.

SYLLABUS

Hrs	Frontal teaching
5	Cytoskeleton: structure and composition. Microfilament and microtubule and role of proteins associated with them in pathological conditions. Polymerization and depolymerization kinetics. Intermediate filaments: classification, structural organization. Keratins.
4	Cellular engines: dynein, kinesine, myosine
3	Extracellular matrix: organization of extracellular matrix proteins. Fibronectin, laminin, fibrillin, nidogen, SPARC, thrombospondin, Tenascin. The proteoglycans: SLRP, proteoglycans of the basal lamina. Lectine. Heparan sulphate of the cell surface.
4	Extracellular vesicles: role of membrane vesicles/exosomes in cellular communication. Protein and lipid content, mRNA and sRNA.
3	Stem cells and stem cell niche.
4	Extracellular vesicle involvement in regenerative medicine.
4	Cell-to-cell and cell-to-matrix junctions.
Hrs	Others
2	Students' seminars