UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

MOLECULAR BIOLOGY OF THE CELL

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/11 (MOLECULAR BIOLOGY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	EXPERIMENTAL AND APPLIED BIOLOGY
Curriculum	Scienze biomediche molecolari
Year of study	1°
Period	2nd semester (01/03/2022 - 14/06/2022)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	MONTECUCCO ALESSANDRA (titolare) - 6 ECTS
Prerequisites	Students should be aware of the fundamental of molecular biology: structure of nucleic acids and proteins, general mechanisms of DNA replication, transcription, translation, and techniques of molecular biology.
Learning outcomes	Understanding the molecular mechanisms controlling cell cycle progression and the cellular response to genotoxic stress.
Course contents	This course concerns the molecular mechanisms underlying cell cycle control in eukaryotic cells. Main topics are: - Model systems to study cell cycle control: yeasts, X. laevis, mammalian cells. - Mechanisms that control cell cycle progression: genetic and epigenetic control of DNA replication and genome segregation, cell cycle checkpoints, DNA damage response and cell senescence.

	- Cell death: apoptosis, autophagy, necrosis. - Functional organization of cell nucleus throughout cell cycle and in response to cell stress. - Chromatin organization: the histone code. - Gene targeting and genome editing: homologous recombination, Zn-finger nucleases, CRISPR/Cas9 system. siRNA-mediated down-regulation of gene expression. - Protein networks: two hybrid system, FRET, FRAP.
Teaching methods	Lectures and seminars. If necessary, due to pandemic, lectures will be online
Reccomended or required readings	- Molecular Biology of the Cell (Sixth Edition) Albert B. et al. - Essential Cell Biology, B. Alberts et al. 5th Edition Norton & C. - Molecular Biology of the Gene, Watson, Baker, Bell, Gann, Levine, Losick, 7th edition.
Assessment methods	Oral
Further information	Oral
Sustainable development goals - Agenda 2030	The goals