SUBJECT CARD

Faculty of Medicine and Health Sciences
Medicine
Form of studies: Full-time course
Degree: long-cycle Master's programme
Specializations: No specialization
Academic year: 2022/2023

SUBJECT NAME	
SUBJECT NAME	**Cytobiology**
NUMBER OF ECTS POINTS:	3
LANGUAGE OF INSTRUCTION	English
TEACHER(S)	Prof. Jadwiga Mirecka MD, PhD MA Bożena Wójcik
PERSON RESPONSIBLE	Prof. Jadwiga Mirecka
NUMBER OF HOURS:	
LECTURES:	26 hours
CLASSES:	-
SEMINARS:	13 seminars
MAIN GOALS	
GOAL1:	To make students acquainted with cell structures and functions in relation to their specialization
GOAL2:	Presentation of mechanisms underlying basic cell processes: intercellular signaling, cell division, ageing, programmed cell death.
LEARNING OUTCOMES	
MW1:	Student: Describes structure and function of cells with particular emphasis on biological membranes, intracellular compartments, cell nucleus, autonomic organelle (mitochondria, peroxisomes) and cell skeleton.
MW2:	Lists and describes mechanisms of transports across the membrane and with the membrane(exocytosis and endocytosis)
MW3:	Explains dynamic relations between intracellular structures in relation to function of various cells and impairment of this function
MW4:	Describes mechanism of inter and intracellular signaling
MW5:	Describes the process of cell ageing and programmed death
MW6:	Characterizes the stem cells and their application in medicine

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MU1:	Student :Recognizes cell organelle on electron-micrographs
INTRODUCTORY REQUIREMENTS	
	None
COURSE PROGRAM	DESCRIPTION
LECTURE 1:	Biological membranes. The types and role of lipids. Membrane proteins – association with the membrane, functional significance. Transport across the membranes.
LECTURE 2:	Cell nucleus during interphase. The structure of chromatin and its changes depending on a functional stage. Replication and transcription factories. Nucleolus. The cell envelope, nuclear pores and regulation of the transport through the pores.
LECTURE 3:	Ribosomes and destination of proteins synthesized on free ribosomes. Endoplasmic reticulum. Binding of ribosomes to the membrane, co-translational transport of peptides across the membrane of endoplasmic reticulum., insertion of proteins into the membrane. Posttranslational modifications of proteins in the endoplasmic reticulum.
LECTURE 4:	Intracellular flow of membranes, mechanism of their differentiation. The structure and function of the Golgi apparatus and Golgi related membranous compartments (CGN andTGN).
LECTURE 5:	Transport with the membrane.Constitutive and regulated exocytosis. Physical and chemical processing of secretory products. Endocytosis of liquid phase (pinocytosis and receptor mediated endocytosis) and of solid phase (phagocytosis)
LECTURE 6:	Endosomal compartments and their significance. Lysosomes: labeling and segregation of lysosomal enzymes. Various pathways for transport of materials destined for lysosomal degradation. Defects in functioning of lysosomes.
LECTURE 7:	Autonomic cell organelles: mitochondria and peroxisomes. Their structure, intracellular role and significance of their defects
LECTURE 8:	Elements of the cell skeleton. Microtubules, dynamics of their polimerization and depolimerization, microtubules associated proteins (MAPs) .Actin filaments – proteins regulating their assembly, disassembly and spatial arrangement. Motile phenomena depending on microtubules and actin filaments. Characteristics of intermediate filaments – their structure, tissue specificity and significance.
LECTURE 9:	Inter-and intracellular signaling. part I . Membrane receptors linked to protein G. Main effectors and modes of cell response.

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LECTURE 10:	Inter-and intracellular signaling. part II. Membrane receptors linked to enzymes. Intracellular receptors. the role of Ca^{2+} In regulation of cell function.
LECTURE 11:	The role of protooncogenes and tumor suppressor genes in regulation of normal cell processes as well as in oncogenic cell transformation.
LECTURE 12:	Cell ageing in vitro and in vivo The programmed cell death – mechanism of apoptosis activation, inducing factors, intracellular regulation.
LECTURE 13:	Adhesion molecules. Linkage to other cells and to extracellular matrix. The stem cells and their significance in medicine.
SEMINARS 1 -13:	After each lecture there is a seminar on the same topic. Discussion during seminars is supplemented by demonstrations of electron-micrographs and videos.
DIDACTIC METHODS (APPLIED)	DESCRIPTION
	Illustrated lectures, discussions, video demonstrations, didactic games
STUDENTS WORKLOAD:	
CONTACT HOURS WITH THE ACADEMIC TEACHER	Lectures + seminars: 39 h.
HOURS WITHOUT THE PARTICIPATION OF THE ACADEMIC TEACHER	Preparation for classes: 13 h. Preparation for the exam: 30 h.
TOTAL NUMBER OF HOURS FOR THE COURSE	82 h.
CONDITIONS FOR COURSE COMPLETION	
	Attendance on seminars with active participation plus positive results of quizzes. Attendance at all classes is mandatory. The condition for admission to the exam is passing seminars.
METHODS OF ASSESMENT:	
IN TERMS OF KNOWLEDGE:	Quizess, MCQ, written open questions, oral exam (as a IIIrd term)
IN TERMS OF SKILLS:	Current evaluation during seminars
IN TERMS OF SOCIAL COMPETENCE:	-
FORMATIVE:	Quizess on seminars

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SUMMATIVE (I & II)	EXAM: Ist term: MCQ - 50 questions RETAKE EXAM: 6 open questions, written answers evaluated in points (0-3)
GRADING SCALE	
3,0 (Satisfactory)	Ist term.:33-37 correct answers or IInd term 9-10,5 points
3,5 (Satisfactory plus)	Ist term.38 – 41 correct answers or IInd term 11-12,5 points
4,0 (Good)	I$^{s}_{t}$ term 42 – 45 correct answers or IInd term 13 -14,5 points
4,5 (Good plus)	Ist term 46 – 49 correct answers or IInd term 15 – 16 points
5,0 (Very Good)	Ist term. 50 > correct answers or IInd term 16,5> points
BASIC LITERATURE	
	"Essential Cell Biology." Alberts, Bray, Hopkin, Johnson, Lewis, Raff, Roberts, Walter. Published by Garland Science, Tylor & Francis Group LLC, (latest edition)
SUPPLEMENTARY LITERATURE	
	„Cell and Molecular Biology" N.Chandar and S.Viselli.Lippincott's Illustratted Review, ed.R.A.Harvey. Wolters Kluwe, Lippincott Williams & Wilkins. (latest edition)