

**Subject card**

<b>Subject name and code</b>	Receptors and mechanisms of cell signaling, PG_00149324						
<b>Field of study</b>	Medical Biology						
<b>Date of commencement of studies</b>	October 2024	<b>Academic year of realisation of subject</b>			2026/2027		
<b>Education level</b>	undergraduate studies	<b>Subject group</b>			Optional subject group		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	3	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	6	<b>ECTS credits</b>			1.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>					
<b>Conducting unit</b>	Faculty of Biology						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Ziemowit Ciepielewski				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	15		2.0		8.0	25
<b>Subject objectives</b>	<ul style="list-style-type: none"> <li>To familiarise students with the types of biologically active compounds and their modes of action on cells.</li> <li>To familiarise students with the biology of receptors and the variety of membrane mechanisms involved in the transport of signalling substances.</li> <li>To understand the importance of intercellular communication processes (signal transduction) and how they are regulated for the proper functioning of the animal and human organism.</li> <li>To identify the mechanism and mode of action of selected drugs, psychoactive substances and toxins in the body, their effects on behaviour and cognitive processes.</li> </ul>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMEDL3_W02] describes the structure and properties of basic types of biological macromolecules, molecular mechanisms of the pathways of basal metabolism and flow of genetic information, and sources of variation in organisms; explains the rules of inheritance	describes, explains and compares the systemic control mechanisms in animal and human organisms (including from onto- and phylogenetic) and the neurobiological and genetic basis of their disorders	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion
	[BIOLMEDL3_W03] knows the structure of the animal or human organism, the processes and functional relationships at the cellular, tissue, organ and organismal levels, and explains their relationship to behavior and adaptation of the organism to changing environmental conditions	describes and knows the importance of receptor types and their functions in terms of cell and organism functioning	[SW4] test/exam - oral or written
	[BIOLMEDL3_W06] describes, explains and compares systemic control mechanisms in animal and human organisms (including onto- and phylogenetic points of view) and the neurobiological and genetic basis of different disorders	knows the structure of the animal or human organism, the processes and relationships functional relationships at cellular, tissue, organ and organismal level and explains their relationship to behaviour and adaptation of the organism to changing environmental conditions	[SW4] test/exam - oral or written
	[BIOLMEDL3_U05] synthesises data from different sources and draws appropriate conclusions from them	understands the importance of correct inference	[SU4] test/exam - oral or written
	[BIOLMEDL3_K01] understands the need for lifelong learning and to update his/her knowledge of medical biology and related disciplines	-describes the structure and properties of basic types of macromolecules biological molecules and their receptors, the molecular mechanisms of basal metabolic pathways	[SK4] test/exam - oral or written
[BIOLMEDL3_U11] is able to use language specialized for medical biology in a way that is clear and accessible to both specialists and non-specialists alike	understands the specialised language used in laboratory diagnostics and neuroscience	[SU1] oral statement/conversation/discussion [SU4] test/exam - oral or written	
Subject contents	Cell membrane, membrane proteins, main principles of signal transduction. Receptor theories. Receptors and secondary messengers - types of receptors as apparatus for cell communication with the extracellular environment, types of signals (ions, ligands), G proteins, nitric oxide, calcium ions as intracellular signalling, tyrosine kinases. Classification of receptors (ion- and metabotropic receptors). Pre- and postsynaptic receptors, autoreceptors. Cholinergic receptors. Receptors for catecholamines. Histamine receptors. Serotonin receptors. Nucleotide receptors. Receptors for amino acids. Peptide compounds and their receptors: receptors for cytokines, receptors for tropic hormones (prolactin, growth hormone, ACTH, thyrotropin), opioid receptors. Receptors for endocannabinoids. Receptors for steroid hormones. Gasotransmitters and their mechanism of action. Toxins, drugs and psychoactive substances versus receptor systems (effects of selected alkaloids plant and animal venoms). Adaptive mechanisms of receptor systems. Importance of intercellular communication processes (signal transduction) in the integration of the nervous, endocrine and immune systems of animals and man.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	100.0%
Recommended reading	Basic literature	<p>The lecture is the author's study of issues in neurobiology and neurophysiology based on many years of study of primary literature. Literature required for final course credit (passing the exam):</p> <p>A.1. used during the class  Nowak Z.J., Zawilska B.J. Receptors and mechanisms of signal transduction. Wydawnictwo Naukowe PWN, Warszawa, 2004  Kostowski W.I., Pharmacology. Podstawy Farmakoterapii. Wydawnictwo Lekarskie PZWL, Warszawa, 2008.  Roberts M.F., Kruchten A.E. Receptor Biology. Wiley-VCH, Weinheim, 2016.</p> <p>A.2. studied independently by the student  Lewandowska D., Orzeł-Gryglewska J., Jurkowlaniec E. 2019. animal and human physiology, University of Gdańsk Publishing House  Konturek S. J. Human physiology. Textbook for medical students. Elsevier Urban &amp; Partner, Wrocław, 2007.</p>	

	Supplementary literature	Supplementary literature Sadowski B. Biological mechanisms of human and animal behaviour. Wydawnictwo Naukowe PWN, Warszawa. 2005. Kusnecov A.W., Anisman H. The WileyBlackwell Handbook of Psychoneuroimmunology, John Wiley & Sons, Ltd, 2014. Pfaff D.W. Hormones, Brain and Behavior. Second Edition. Elsevier Academic Press, 2009.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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