

Subject card

Subject name and code	Neural regulation of motor functions, PG_00207343						
Field of study	Biology						
Date of commencement of studies	October 2026		Academic year of realisation of subject			2026/2027	
Education level	Master's studies		Subject group			Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study	
Mode of study	full-time studies		Mode of delivery			at the university	
Year of study	1		Language of instruction			Polish	
Semester of study	2		ECTS credits			2.0	
Learning profile	academic		Assessment form			credit	
Conducting unit	Laboratory of Neurobiology -> Department of Animal and Human Physiology -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Beata Grembecka				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		4.0		16.0	50
Subject objectives	The purpose of the subject is to understand the mechanisms of motor function regulation at various levels of the nervous system organization and experimental models of motor disorders used in rodent studies. Acquisition of skills to independently deepen and present knowledge about neuronal mechanisms of motor function regulation and experimental models of motor disorders used in rodent studies it is proposed						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMU2_W05] has an in-depth knowledge and understanding of the dynamic development of the biological sciences and is well versed in new research trends and disciplines	During the preparation for classes, the student searches and analyzes the latest scientific articles	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[BIOLMU2_W04] has in-depth knowledge of the chosen specialization in the biological sciences	The student acquires expert knowledge in a selected thematic area and is able to present it in written or oral form	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[BIOLMU2_U07] is able to critically compare biological information from various sources and draw justified conclusions on this basis	To address the problem, the student identifies relevant articles and demonstrates the ability to draw appropriate conclusions from them	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
	[BIOLMU2_U02] is able to proficiently use the scientific literature of the biological speciality studied	During the preparation for classes, the student searches and analyzes the latest scientific articles	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
	[BIOLMU2_K07] is ready to systematically update biological knowledge and information on its practical applications	To complete the assigned task, the student consults current scientific articles that provide information on the practical implementation	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report
	[BIOLMU2_K05] is ready to use recognized sources of scientific and popular information in the field of biological sciences in order to deepen his/her knowledge	To address the problem, the student independently conducts a literature search in scientific databases and selects articles that are relevant to the task	[SK1] oral statement/conversation/ discussion
Subject contents	Movement as a fundamental form of behavior in humans and animals. Categories of motor behaviors occurring in humans and animals. Levels of functional organization of movement. Organization of motor centers of the spinal cord. The level of the brainstem and midbrain. Functional organization of the basal nuclei. Control of automatic and voluntary movements. Correction of motor functions at the level of the cerebellum. Somatotopy in the motor structures of the cerebral cortex. Neurotransmitter and neuropeptide systems involved in the regulation of motor functions. Neurophysiological properties of motor neurons and mirror neurons. Neuronal basis of motor function control disorders: plegia, dyskinesia, dystonia, amyotrophic lateral sclerosis, Huntingtons chorea, Parkinsons disease, cerebellar ataxia, speech disorders. Experimental models of motor disorders in rodents. Methods of behavioral assessment of motor skills in rodents. Review of the latest research using experimental models of motor disorders.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Active participation in conservatories	51.0%	40.0%
	attendance at conservatories	51.0%	20.0%
	Project	51.0%	40.0%
Recommended reading	Basic literature	Handbook of Basal Ganglia Structure and Function, Heinz Steiner, Kuei Tseng, Academic Press, 2016;	
		Mózg człowieka. Anatomia czynnościowa mózgowia, John Nolte, red. wyd. pol. Janusz Moryś, Elsevier Urban & Wrocław 2011,	
		Neuroanatomia kliniczna, Paul A. Young, red. wyd. pol. Janusz Moryś, Elsevier Urban & Wrocław 2016,	
		Biologiczne mechanizmy zachowania się ludzi i zwierząt Bogdan Sadowski, PWN, Warszawa 2007	
		Current scientific articles recommended by the lecturer.	
	Supplementary literature	Scientific articles recommended by the lecturer.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			

Work placement	Not applicable
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