

Subject card

Subject name and code	The selected aspects of stress biology, PG_00146040						
Field of study	Biology						
Date of commencement of studies	October 2023	Academic year of realisation of subject				2025/2026	
Education level	Bachelor's studies	Subject group				Optional subject group	
Mode of study	full-time studies	Mode of delivery				at the university	
Year of study	3	Language of instruction				Polish	
Semester of study	6	ECTS credits				1.0	
Learning profile	academic	Assessment form					
Conducting unit	Laboratory of Neurophysiology and Neurochemistry -> Department of Animal and Human Physiology -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Ziemowit Ciepielewski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	To learn about the role of the neurohormonal system in the mechanism of the stress and learn about the mechanisms regulating the course of the stress response. Understand the concept of non-specificity and specificity of the stress response at different levels of organisation (cellular, organismal, organismal). To learn about the influence of genotype and phenotype in terms of individual reactivity and sensitivity to stress. To understand the integrative aspects of the stress responseTo understand the concept of stress as a form of behaviour and an adaptive mechanism.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLL3_W04] the graduate knows and understands the course of physiological processes and their relation to adaptation of the organism to changing environmental conditions	The student knows the basic adaptation mechanisms of the organism, with particular emphasis on the stress response. They can identify types of stressors, and physiological and biochemical markers of stress.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	[BIOLL3_U07] the graduate is able to independently search and use available sources of biological information, including electronic sources	The student makes independent use of biomedical databases in the field of stress science.	[SU1] oral statement/conversation/ discussion
	[BIOLL3_W10] the graduate is familiar with the development and current state of knowledge and the latest trends in biology, as well as their relationship with other natural disciplines	The student is familiar with the latest data on stress biology in its broadest sense, as well as being aware of trends in stress and related sciences.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	[BIOLL3_U05] the graduate is able to synthesise data from various sources and draw appropriate conclusions on this basis	The student uses data from different scientific disciplines to analyse the biology and physiology of stress	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
BIOLL3_K01	The student is aware of his/her knowledge in the field of stress biology and understands the need for continuous improvement.	[SK1] oral statement/conversation/ discussion [SK8] observation of student's independent or team work	
Subject contents	Definitions of the stress response. Concepts: homeostasis, rheostasis, allostasis and allostatic load. Anatomical and neuroanatomical components of the stress response. The sympathetic-adrenal system in the stress response. The hypothalamic-pituitary-adrenal-cortical axis. Genetic polymorphisms in the stress response. Modulation of the course of the stress response (vasopressin, oxytocin, growth hormone, prolactin, opioid system, endocannabinoid system). Diseases induced by the stress response - psychosomatic aspects. Basic concepts in psychosomatics. Central neuronal circuits for the stress response. Stress-induced immunomodulation. Types of stress: eustress, distress, physiological stress, metabolic stress, neurogenic stress, psychological stress. Prenatal stress. Stress and trauma. PTSD as an example of a psychosomatic disorder. The brain as a target organ for steroid hormones. Stress and brain plasticity. Stress and memory processes. Learning and stress. Stress and the immune system - role in chronic diseases (viral diseases, cancer, civilisation diseases). Coping with stress (individual variability).		
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	The lecture is the author's study of the neurobiology and physiology of stress based on a long-term study of the reference literature. Fink G. (ed) Stress science: Neuroendocrinology, 2010, Academic Press, Elsevier. Soreq H., Friedman A., Kaufer D. Stress - From Molecules to Behavior: A Comprehensive Analysis of the Neurobiology of Stress Responses, 2010, Wiley-Blackwell	
	Supplementary literature	Contrada RJ, Baum A. The Handbook of Stress Science: Biology, Psychology, and Health, 2012, Springer Pfaff D., Joels M. (eds) Hormones, Brain and Behavior, 3rd Edition, 2016, Academic Press, Elsevier. Materials (review papers in English and Polish) provided by the instructor or suggested by students	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. vasopressin as a stress hormone 2. hypothalamic-pituitary-adrenal (PPN) axis 3. sympathetic-adrenal axis 4. epigenetic effects of stress 5. prenatal and early childhood stress 6. effects of adrenaline in the body 7. effects of cortisol in the body (genomic and non-genomic effects of glucocorticoids) 8. CRH and other urocortins-role in stress (CRH as a major anxiogenic factor) 9. definitions of stress, GAS, the concept of allostasis 10. stress-induced diseases 		
Work placement	Not applicable		

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