University of Gdańsk

Subject card

Subject name and code	Neuroendocrinology, PG_00148827						
Field of study	Medical Biology						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study 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	2		Language of instruction	Polish			
Semester of study	4		ECTS credits	1.0			
Learning profile	academic		Assessment form	credit			
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		3.0	7.0	25	
Subject objectives	To learn the basics of the neurohormonal system (cellular, organ and organismal levels). Understanding the role of the neurohormonal system in the systemic regulation of the organism (feedback mechanism). To learn about the role of the neurohormonal system as a basic and essential system in the regulation of various forms of behaviour (gastrointestinal, defence, sexual and exploratory drives). To learn about pathologies and psychopathologies related to and/or resulting from dysfunction of neurohormonal systems.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	The student knows the structure of the neurohormonal system, neurohormonal axes, and understands basic homeostatic mechanisms. He/she knows the basic mechanisms of regulation of metabolism, water-electrolyte balance and social behaviour, including reproduction and stress response.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_W05] knows the structure, properties and functions of human cells, tissues and organs; human physiological and biochemical processes and mechanisms of disease pathophysiology	The student knows the structure of the neurohormonal axes and the glands associated with them, and identifies the main hormones, both in physiological and pathological states.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_W10] understands and describes the physicochemical and biological basis of health sciences	Students will be familiar with the neurohormonal basis of human organism functioning	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_K09] is ready to work with honesty and integrity in his scientific and professional work	The student is able to work in the field of biomedical sciences	[SK1] oral statement/conversation/ discussion
[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	Students will understand and distinguish between the concepts of homeostasis and allostasis and identify underlying mechanisms. The student has knowledge of the nuerobiological basis of behaviour and the most common neuroendocrine diseases.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_K01] understands the need for lifelong learning and to update his/her knowledge of medical biology and related disciplines	The student seeks to further his/ her knowledge of neuroendocrinology in the broadest sense.	[SK1] oral statement/conversation/ discussion
[BIOLMEDL3_U07] is able to identify problems corresponding to the needs of an individual and a social group and to undertake basic diagnostic, preventive and educational activities appropriate to the profession of medical biologist	Students will be able to identify basic problems related to the field of neuroendocrinology as well as undertake diagnostic and educational measures.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
[BIOLMEDL3_W11] posiada zaawansowaną wiedzę dotyczącą metod oceny stanu zdrowia oraz objawów i przyczyn wybranych zaburzeń i zmian chorobowych oraz zna podstawy zdrowego trybu życia, potrafi je uzasadnić i promować	The student is familiar with the basic symptoms of neuroendocrine diseases and knows the basic principles of prevention of these diseases.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_W07] has advanced knowledge of medical biology and is familiar with the health sciences terminology	The student is familiar with the professional vocabulary of neuroendocrinology and neurobiology.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion

Subject contents

The internal environment of the body and its role in the regulation of cell and organ reactivity. The concepts of allostasis and homeostasis. Neurohormonal coupling as a basic system of systemic integration. Cellular receptors and modes of signal transduction into the cell (G proteins, cyclic AMP, calcium cascade). Types of ligands in the neurohormonal system. Vasopressin and oxytocin -hormones of the hypothalamus. The hypothalamic-pituitary system. Hypothalamic hormones controlling anterior pituitary lobe function. Hormones of the anterior and posterior lobe of the pituitary. Adrenal medullary function, physiological effects of catecholamines. Activity of the adrenal cortex and the action of its hormones
steroid hormones. Role of medullary and adrenal cortex hormones in adaptive responses. Endocrine function of the thyroid gland, parathyroid glands, sex glands, pancreas and pineal gland. Anabolic and catabolic hormones. Involvement of neurohormonal axes in various forms of behaviour. Endogenous opioids. Endocrine disorders (including the effects of over- and under-activity of individual glands) in selected disease entities.

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 own study of the neurobiology and physiology of stress based on many years of study of the source literature. Literature required for final course credit (passing the exam): 1. Wilkinson M., Brown R.E.,2015 An Introduction to Neuroendocrinology. Cambridge 2. Murray R. K. et al, 2015. Harper's Biochemistry. Wydawnictwo Lekarskie PZWL, Warsaw 3. solomon E. P., Berg L. R., Martin D. W., Villee C. A., 2012 (reprint). Biology. Oficyna Wydawnicza Multico, W-wa 4 Fink G., Pfaff D., Levine J. Handbook of Neuroendocrinology, 2012, 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	1 Melmed S., Polonsky K. S., Larsen P. R., Kronenberg H. M., 2016 Williams Textbook of Endocrinology. Elsevier - Health Sciences Division 2 Nussey S. S., Whitehead S. A., 2013. endocrinology. CRC Press 3. Contrada RJ, Baum A. The Handbook of Stress Science: Biology, Psychology, and Health, 2012, Springer 4. 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	1. vasopressin and oxytocin 2. growth hormone, prolactin, IGF-1- regulation of secretion and function 3. thyroid axis and thyroid dysfunction 4. hypothalamic-pituitary-adrenal axis. Role in the stress response. 5. stress definition, mechanism, effect on the body 6 Brain-gut axis 7.adrenal diseases.	
Work placement	Not applicable	

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