1.	**Field of study**	**Biotechnology**
2.	Faculty	Faculty of Natural Sciences
3.	Academic year of entry	2019/2020 (winter term), 2020/2021 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

Module: Physiological bases for medicament effects

Module code: 2BT_E_22

1. Number of the ECTS credits: 4

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
2BT_E_22_1	Student demonstrates the knowledge of techniques and tools applied in pharmacology, is able to find connections between physiological and pharmacological data, considering the challenges of biotechnological medicaments.	2BT_E_W02_P 2BT_E_W04_P	4 4
2BT_E_22_2	Student operates with the acquired knowledge joining pharmacology and physiology, is able to process and analyze data and present them in an assessable way.	2BT_E_W05_P	4
2BT_E_22_3	Student demonstrates the knowledge of English pharmacological and physiological pharmacology that enables them to acquire information from electronic sources, medical databases including molecular targets and mechanisms of action.	2BT_E_U05_P 2BT_E_W09_P	3 3
2BT_E_22_4	Student is able to analyze critically the information about medicaments, found without tutor's help; is able to differentiate between commercial and scientific description.	2BT_E_K04_P 2BT_E_U02_P	4 4
2BT_E_22_5	Student can present scientific articles and reports on physiology, pathology and pharmacology.	2BT_E_U06_P	4
2BT_E_22_6	Student is able to draw conclusions from available metaanalyses and clinical researches, connect them with his/her knowledge and appreciate the significance of the data obtained from the studies on large, randomized groups by means of adequate statistical tools.	2BT_E_K01_P 2BT_E_U01_P	4 4
2BT_E_22_7	Student is in a habit to use various sources of scientific information, including newsletters and scientific portals and to apply the rulet of critical concluding during the assessment of their reliability and credibility. Student independently, of their own initiative, searches for medicament information and share it with other students during the classes.	2BT_E_K01_P 2BT_E_K02_P	3 4

3. Module description

Description	The aim of the classes is to acquire the knowledge of molecular targets and mechanisms of medicament action, including physiological causation (homeostasis) and practical skills enabling the student to use the data from medicament decscriptions, including biotechnological medicaments. The

	lectures cover the review of physiological and pathophysiological bases of pharmacology (medicament receptors, cascades of induced or inhibited reactions) and elements of pharmacokinetics and pharmacoeconomics. Practical trainings teach students how to use virtual pharmacokinetical models, dose-effect correlations and how to search for data in medicament bases and how to analyze them. Student's own work with handbooks and electronic sources of data is aimed at the preparation for the classes and creating of schemes and reports used during the classes.
Prerequisites	Knowledge and skills in animal physiology, biochemistry, molecular biology and cell biology acquired during the previous study stages, enabling the students to understand the language of pharmacology and pathophysiological attempt to the medicament description. It is recommended, though not necessary to possess elementary knowledge of patophysiology.

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
2BT_E_22_w_1	Colloquium	Written work checking the level of knowledge and skills acquired during the laboratory classes.	2BT_E_22_1, 2BT_E_22_2, 2BT_E_22_3, 2BT_E_22_4, 2BT_E_22_6
2BT_E_22_w_2	Current evaluation of practical skills	Current substantial evaluation of the realization of tasks, models, schemes, graphs and diagrams. The evaluation of abilities to collect and interpret data from reference medical databases. Substantial and formal evaluation of presented scientific reports.	2BT_E_22_1, 2BT_E_22_2, 2BT_E_22_3, 2BT_E_22_4, 2BT_E_22_5, 2BT_E_22_6, 2BT_E_22_7
2BT_E_22_w_3	Final colloquium	Final work (presentation) on the molecular target and mechanism of action of a chosen medicament.	2BT_E_22_2, 2BT_E_22_4, 2BT_E_22_5, 2BT_E_22_6, 2BT_E_22_7

5. Forms of teaching

code	form of teaching			required hours of student's own work		assessment of the learning outcomes of the module
	type	description (including teaching methods)	number of hours	description	number of hours	
2BT_E_22_fs_1	lecture	Lecture supported by audiovisual devices, including schemes demonstrating molecular targets and mechanisms of medicament action.	15	Preparation fo colloquia and final pass, including individual learning of the parts of material, indicated by the lecturer, that have been omitted during the lectures.	35	2BT_E_22_w_3
2BT_E_22_fs_2	practical classes	Analyses of the structure and ability to acquire information from the reference databases about the medicaments. Pharmacikinetic and pharmacodynamic models. Construction of schemes demonstrating the mechanisms of medicament action. Experiments in virtual laboratory.	20	Searching for information in the databases used during the classes, preparation of a mini-presentation based on the data collected without the tutor's help.	45	2BT_E_22_w_1, 2BT_E_22_w_2
2BT_E_22_fs_3	discussion classes	Discuss the presented mini-presentation, analysis and finding solutions to emerging problems; Reference to the literature and online sources	10	Preparation of a mini-presentation based on self-collected data	15	2BT_E_22_w_3