1.	Field of study	Biotechnology
2.	Faculty	Faculty of Natural Sciences
3.	Academic year of entry	2022/2023 (winter term), 2023/2024 (winter term), 2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

Module: Molecular cytogenetics

Module code: 2BT_15A

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_15_01	Student develops the knowledge about the nuclear genome organization	2BT_W01_P 2BT_W02_P	4 4
2BT_15_02	Student is familiar with the basic and advanced techniques of molecular cytogenetics.	2BT_W04_P	5
2BT_15_03	Student knows how to plan the experiments in the field of molecular cytogenetics	2BT_U01_P	4
2BT_15_04	Student is competent to perform an experiment using FISH method	2BT_U01_P	4
2BT_15_05	Student possesses skills to interpret and discus the results of his experiments based on the scientific knowledge	2BT_K01_P 2BT_U02_P 2BT_U03_P 2BT_U06_P	4 5 4 5
2BT_15_06	Student improves his skills in operating fluorescence microscope	2BT_U01_P	5
2BT_15_07	Student takes the responsibility for his work and the laboratory equipment he is using	2BT_K02_P 2BT_K03_P	5 5

3. Module description

Description	In this module student becomes acquainted with detailed knowledge in the area of the molecular cytogenetic. Student becomes familiar with the basic method of the molecular cytogenetics – fluorescence in situ hybridization (FISH) and its modifications, he becomes acquainted with the confocal microscopy, flow cytometry and image cytometry. Student develops his knowledge in the field of comparative genome analyses, the importance of chromosomal rearrangements in species evolution, and genome's polyploidization and diploidization. Student becomes familiar with practical exploitation

	of the molecular cytogenetics in medicine and plant breeding. During laboratory classes student develops the skills in planning and performing the experiments using FISH method and in interpreting his experiments' results.
Prerequisites	Knowledge from the field of basic genetics and plant cytogenetics.

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
2BT_15_w01	Coursework	according to the Syllabus	2BT_15_01, 2BT_15_02, 2BT_15_03, 2BT_15_04, 2BT_15_05, 2BT_15_06, 2BT_15_07

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_15_fs01	lecture	Lecture presenting the chosen topics of the molecular cytogenetics – computer presentation with audio-visual aids.	5	Working with textbooks, reading of the supplementary scientific articles	5	2BT_15_w01
2BT_15_fs02	laboratory classes	Individual work in the molecular cytogenetic laboratory, realization of the experiments according to the instructions, interpretation of the results.	45	Preparation to laboratory tasks on the basis of the recommended data sources.	30	2BT_15_w01
2BT_15_fs03	discussion classes	Discussion on issues learned in lectures and observations during laboratory classes	10	Working with the textbook, fixing material from lectures and laboratories.	5	2BT_15_w01