



Subject card

Subject name and code	Mycology and Parasitology Molecular, PG_00058257						
Field of study	Biotechnology						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			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			5.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Microbiology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Anna Brillowska-Dąbrowska					
	Teachers	dr hab. inż. Anna Brillowska-Dąbrowska dr hab. inż. Lucyna Holec-Gąsior dr inż. Martyna Mroczyńska-Szeląg					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	45.0	0.0	0.0	75
	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	75		10.0		40.0	125
Subject objectives	Knowledge and understanding of the processes relating to replication and expression of the genetic material of microscopic fungi and parasites. Knowledge of a variety of molecular biology techniques and the ability to use them in the disciplines of mycology and parasitology. Gaining the skill to both independent work and in group in molecular biology lab using the tools of research and analysis and develop the results.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_K02] is aware of the limitations and the necessity of continuous development of knowledge and technology; understands the need for education and constant training	The student has basic knowledge of the field of mycology and parasitology. Understands and can explain processes occurring in these organisms related to acquisition antimycotic resistance (mycology) and related to invasion of host cells (parasitology). The student knows choose and apply rationally molecular biology techniques for identification of these organisms	[SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work
	[K7_U05] is able to apply instrumental methods of quantitative and qualitative analysis and studies on activity of biomolecules, select and apply diagnostic and analytical methods in the field of his/her specialty with particular emphasis on genetic, molecular and microbiological diagnostics and diagnostics based on antigen-antibody reaction	The student is able to choose rationally methods suitable for implementation method research tasks. Can optimize the protocol diagnostic procedure	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	[K7_W01] has advanced knowledge of methods of genetic engineering and molecular genetics, functioning of the immune system and mechanisms of immune system response, diagnostic methods, and analytical methods in the area of specialty	The student is able to use information from genetic engineering, molecular genetics, and immunology for molecular research on fungi and parasites. Is able to plan experiments in this area and analyze their results.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents

1. Mycology - introduction.
2. Taxonomy of fungi - the impact of the development of molecular biology to the reclassification of fungi.
3. The use of molecular biology methods in mycology.
4. Molecular diagnosis of fungal infections.
5. Molecular basis of fungal resistance to antimycotics (azoles and echinocandins).
6. The study of gene expression levels.
7. Parasitism and other interspecies relationships.
8. Parasites in the system of the animal world.
9. Environmental determinants of parasitic diseases.
10. Factors immune system parasite-host.
11. Biochemical aspects of the interaction of two organisms of particular importance in medicine
- 12 The most common parasitic infections.
- 13 Biology and pathogenicity of selected species of parasitic protozoa.
14. Laboratory diagnosis of selected parasitosis: molecular methods for detection of parasites, microscopic examination and serological diagnostics.
15. Basic issues of medical parasitology.

Laboratories

A.

1. Identification of molds and yeasts - 5 hours.
2. Molecular identification of molds and yeasts - 5 hours.
3. The study of gene expression levels of some species of fungi responsible for the resistance to azoles - 15 hours.

B.

1. Microscopy of ready-made preparations of various species of parasites.
2. DNA isolation from canine blood and molecular detection of *Babesia canis* DNA using PCR and real-time PCR.
3. DNA isolation from mouse tissues (liver, heart, brain, kidney, spleen) and molecular detection of *Toxoplasma gondii* tissue cysts in intermediate host tissues using two molecular targets.

	4. Counting tissue cysts in a homogenized brain specimen of mice experimentally infected with Toxoplasma		
Prerequisites and co-requisites	Basic knowledge on molecular biology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written assessment of a lecture on parasitology	60.0%	25.0%
	Report - parasitology laboratories	60.0%	12.0%
	Written assessment of a lecture on mycology	60.0%	25.0%
	Verification tests (3) - parasitology laboratories	60.0%	13.0%
	Report - mycology laboratories	60.0%	12.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"> • · Zarys parazytologii ogólnej Katarzyna Niewiadomska, Teresa Pojmańska, Barbara Machnicka, Andrzej Czubaj, Wydawnictwo Naukowe PWN, 2001 • · Choroby pasożytnicze- epidemiologia, diagnostyka, objawy Alicja Buczek, Wydawnictwo Koliber Lublin, 2010 • · Atlas pasożytów człowieka Alicja Buczek, Wydawnictwo Koliber Lublin, 2005 • · Zarys parazytologii ogólnej Katarzyna Niewiadomska, Teresa Pojmańska, Barbara Machnicka, Andrzej Czubaj, Wydawnictwo Naukowe PWN, 2001 • · Choroby pasożytnicze- epidemiologia, diagnostyka, objawy Alicja Buczek, Wydawnictwo Koliber Lublin, 2010 • · Atlas pasożytów człowieka Alicja Buczek, Wydawnictwo Koliber Lublin, 2005 • "Fungal Infection: Diagnosis and Management" - Malcolm D. Richardson, David W. Warnock, Wiley • "Atlas grzybów chorobotwórczych człowieka" - Paweł Krzyściak, Medpharm Polska 	
	Supplementary literature	<ul style="list-style-type: none"> • Publikacje w czasopismach o charakterze naukowym podane przez prowadzącego • Choroby zakaźne i pasożytnicze Zdzisław Dziubek, Wydawnictwo Lekarskie PZWL, Warszawa, 2010 	
	eResources addresses	Adresy na platformie eNauczenie: Mykologia i parazytologia molekularna 2023/2024 - Moodle ID: 30752 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30752	
Example issues/ example questions/ tasks being completed	Mechanisms of fungal resistance to antimycotics.		
Work placement	Not applicable		