


**KAPITAŁ LUDZKI**  
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez  
Unię Europejską w ramach  
Europejskiego Funduszu  
Społecznego

**UNIA EUROPEJSKA**  
EUROPEJSKI  
FUNDUSZ SPOŁECZNY


Course title		ECTS code	
New concepts in microbiology		13.1.1457	
Name of unit administrating study			
Faculty of Biology			
Studies			
faculty	field of study	type	first tier studies (BA), second tier studies (MA)
Faculty of Biology	Medical Biology	form	full-time
		specialty	all
		specialization	all
Faculty of Biology	Biology	type	first tier studies (BA), second tier studies (MA)
		form	full-time
		specialty	all
Faculty of Biology	Genetics and Experimental Biology	specialization	all
		type	first tier studies (BA)
		form	full-time
Faculty of Biology	Natural Resources Conservation	specialty	all
		specialization	all
		type	first tier studies (BA)
Faculty of Biology	Natural Resources Conservation	form	full-time
		specialty	all
		specialization	all
Teaching staff			
prof. dr hab. Tadeusz Kaczorowski; dr hab. Wojciech Pokora, profesor uczelni; dr Magdalena Płotka			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		3	
Laboratory classes, Lecture		Estimation of working time:	
The realization of activities		Working in contact with teacher – 15 hours	
classroom instruction, online classes		Participation in practical classes – 15 hours	
Number of hours		Consultations – 11 hours	
Lecture: 15 hours, Laboratory classes: 15 hours		The unassisted student work (studying the literature, preparing for the reports, presentations, tests and exams – 19 hours	
		Total: 60 hours	
The academic cycle			
2022/2023 winter semester			
Type of course		Language of instruction	
an elective course		english	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
- Laboratory exercises (individual and team work) Experiments - Lectures with multimedia presentations		Final evaluation	
		- Graded credit - Examination	
		Assessment methods	
		Written exam, reports, test, presentation, practical skills in laboratory	
		The basic criteria for evaluation	
		Assessment criteria or examination requirements:	
		Obtaining 51% points on the exam: giving correct answers to more than half of the questions; attendance and activity during practical part	
Method of verifying required learning outcomes			

**Required courses and introductory requirements****A. Formal requirements**

none

**B. Prerequisites**

none

**Aims of education**

- To introduce students to the basic issues of microbiology according to the current state of knowledge in this field
- To deepen the knowledge and ability to understand the basic laws of antibiotic-related research
- To convey the knowledge on mechanisms of functioning and cooperation of genes, to understand the relationship between microbiome and human body.
- To present modern research methods and to form the ability of asking questions, making evaluations and solving
- To solve uncomplicated experimental problems in the field of microbiology.

**Course contents****Lecture content:**

The lecture will cover a broad range of topics in microbiology, including antibiotic-related research, development and application of a molecular methods to quantify common food pathogens, bacterial communities and microbiome, bacterial pathogenesis

Emphasis will be placed on novel approaches that have the potential to revolutionise future research in microbiology.

The lecture will cover topics on: Biofilm-Associated Infections

Gut microbiota and obesity: Concepts relevant to clinical care.

**Laboratory training content:**

Evaluation of human CCR5 genetic polymorphism from students' own epithelial cells. CCR5 is a receptor involved in inflammatory processes, which has been misused by HIV, to enter host cells. As a result, a defective allele CCR5-Δ32 has been enriched in some populations.

Learning new methods to differentiate bacteria. Understanding basic principles of Gram staining, growing bacterial cells on different media

In the course students will learn basic molecular biology techniques including genomic and plasmid DNA isolation and PCR amplification of the 16S rRNA gene and ligation into a prepared vector.

**Bibliography of literature****A. Literatura wymagana do ostatecznego zaliczenia zajęć (zdania egzaminu):**

Madigan, MT i Martinko JM : Brock biology of Microorganisms. Pearson education, 12th edition

NEW CONCEPTS IN MICROBIOLOGY, 2013, I. Wani

**B. Literatura uzupełniająca**

Hütter, G., Nowak, D., Mossner, M., Ganepola, S., Müßig, A., Allers, K. & others. (2009). Long-term control of HIV by CCR5 Delta32/Delta32 stem-cell transplantation. New England Journal of Medicine, 360, 692–698.

**The learning outcomes (for the field of study and specialization)****Knowledge**

- recognizes the dynamic development of biological sciences and the emergence of new research directions and disciplines
- understands the natural phenomena and processes at various levels of complexity
- recognizes the wealth of contemporary approaches and experimental techniques in biological sciences and properly plans to use them to solve given tasks

**Skills**

- selects and applies research techniques and tools adequate to the problems of the biological specialty studied
- proficiently uses scientific literature of the studied biological specialty
- demonstrates an ability to critically analyze and select biological information, especially that obtained from electronic resources
- plans and performs research tasks or scientific assessment in the field of studied biological specialty, under supervision of a supervisor
- critically confronts biological information from various sources and draws reasonable conclusions on this basis

**Social competence**

- shows initiative and independence in actions, as well as feels the need for lifelong learning
- understands the need to use recognized sources of scientific and popular science information in the field of biological sciences in order to deepen knowledge
- systematically updates biological knowledge and information about its practical applications

**Contact**

tadeusz.kaczorowski@ug.edu.pl

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