



## Subject card

Subject name and code	Implementation of the project "RADIUM", PG_00056523						
Field of study	Biotechnology						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish no remarks		
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	prof. dr hab. inż. Paweł Sachadyn					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	95.0	0.0	0.0	110
	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	110	0.0		0.0		110
Subject objectives	The planned subject aims to determine the levels of selected small-molecule neurotransmitters in the regenerating ear pinna tissues in mice.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_U04	The student is can use the knowledge about the chemical properties of the tested substances in the interpretation of the experimental results			[SU2] Assessment of ability to analyse information		
	K7_W05	The student can use the knowledge about the chemical properties of the tested substances in the design of experiments.			[SW3] Assessment of knowledge contained in written work and projects		
	K7_W01	The student understands the impact of epigenetic factors on the phenotype			[SW1] Assessment of factual knowledge		
Subject contents	The subject of the classes includes:  1. The lecture part intended to explain the goals of the project and present state of the art in the field  2. Laboratory part dedicated to the preparation of tissue samples for analysis, development of a method for extracting the tested compounds from solid tissues, optimization of the conditions for the determination of small molecule neurotransmitters using the L-MS, performance of LC-MS determinations, and analysis of the results.						
Prerequisites and co-requisites	Individual Research Studies						
Assessment methods and criteria	Subject passing criteria	Passing threshold		Percentage of the final grade			
	assessment of involvement in the project implementation	60.0%		55.0%			
	obtained research results	60.0%		45.0%			

Recommended reading	Basic literature	<p>Sosnowski, P., Sass, P., Słonimska, P., Platek, R., Kamińska, J., Baczyński Keller, J., ... &amp; Sachadyn, P. (2022). Regenerative Drug Discovery Using Ear Pinna Punch Wound Model in Mice. <i>Pharmaceuticals</i>, 15(5), 610.</p> <p>Sass, P., Sosnowski, P., Podolak-Popinigis, J., Górniewicz, B., Kamińska, J., Deptuła, M., ... &amp; Sachadyn, P. (2019). Epigenetic inhibitor zebularine activates ear pinna wound closure in the mouse. <i>EBioMedicine</i>, 46, 317-329.</p> <p>van Kesteren, R. E., &amp; Spencer, G. E. (2003). The role of neurotransmitters in neurite outgrowth and synapse formation. <i>Reviews in the neurosciences</i>, 14(3), 217-232.</p>
	Supplementary literature	<p>Alapure, B. V., Lu, Y., Peng, H., &amp; Hong, S. (2018). Surgical denervation of specific cutaneous nerves impedes excisional wound healing of small animal ear pinnae. <i>Molecular neurobiology</i>, 55(2), 1236-1243.</p> <p>Gupta, D., Kaushik, D., &amp; Mohan, V. (2022). Role of neurotransmitters in the regulation of cutaneous wound healing. <i>Experimental Brain Research</i>, 1-11.</p> <p>Frykberg, R. &amp; Banks, J. (2015). Challenges in the treatment of chronic wounds. <i>Advances in wound care</i> ;4:560-582.</p> <p>Hicks, C. W., &amp; Selvin, E. (2019). Epidemiology of peripheral neuropathy and lower extremity disease in diabetes. <i>Current diabetes reports</i>, 19(10), 1-8.</p> <p>Laverdet, B., Danigo, A., Girard, D., Magy, L., Demiot, C., &amp; Desmoulière, A. (2015). <i>Skin innervation: important roles during normal and pathological cutaneous repair</i>.</p> <p>Marcos, J., Renau, N., Valverde, O., Aznar-Lain, G., Gracia-Rubio, I., Gonzalez-Sepulveda, M., ... &amp; Pozo, O. J. (2016). <i>Targeting tryptophan and tyrosine metabolism by liquid chromatography tandem mass spectrometry</i>. <i>Journal of Chromatography</i>, 1434, 91-101.</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>1. The role of peripheral nerves in tissue regeneration. 2. The influence of small molecule neurotransmitters on tissue regeneration. 3. Methods of extracting small molecule neurotransmitters from solid tissues for LC/MS analyses.</p>	
Work placement	Not applicable	