UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

Faculty of Biology and Biotechnology

Course title: TISSUE ENGINEERING

ECTS credit allocation (and other scores): 5

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Natural sciences

Language: English

Number of hours per semester: 50 h.

Course coordinator/ Department and e-mail: Tadeusz Kamiński Department of Animal Anatomy and Physiology; tkam@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Cell encapsulation as a method of using antigenically incompatible cells for transplantation. Cell culture based on scaffolds made of natural and synthetic polymers. Hydrogels and their use in tissue engineering. Comparison of cell culture techniques and conditions for selected applications. Seminar: the latest achievements in tissue engineering.

LECTURES: Basic concepts of tissue engineering. Principles of handling human and animal tissues and cells in vitro. Acquisition of selected types of somatic cells for in vitro culture. Types and properties of scaffolds. Biocompatibility of synthetic materials and methods of its testing.

LEARNING PURPOSE: Learning the basic methods of working with animal cells and synthetic materials used to obtain organs and tissues in vitro.

On completion of the study programme the graduate will gain:

KNOWLEDGE: the student knows the methods and ethical aspects of cell culture outside the body and the production of tissues and organs in vitro; the student knows the principles of work in the laboratory for the culture of hybrid tissues and organs in vitro

SKILLS: the student can conduct simple experiments in the field of in vitro cell and tissue culture and tissue engineering;

SOCIAL COMPETENCIES: the student knows the need for constant education and improvement of professional skills as well as constant monitoring of scientific literature; the student demonstrates readiness and ability to work in a group.

Basic literature:

1. Lanza R, Langer R, Vacanti J, Principles of Tissue Engineering, Wyd. Academic Press, Elsevier, R. 2014

2. Anju Verma, Megha Verma, Anchal Singh, Animal tissue culture principles and applications, Wyd. Elsevier, R. 2020

Supplementary literature:

1. https://www.frontiersin.org/articles/10.3389/fonc.2021.620831/full
2. https://www.frontiersin.org/articles/10.3389/fphar.2018.00006/full

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 54 h.

Student's independent work: 71 h.