

## **(SYLABUS)**

**Name of the department / clinic providing the course:**  
**Department of Cell Culture and Genomic Analysis**

**Course title: Organoids use in science and medicine**

**Course profile: International Doctoral School**

**Speciality: Doctoral School**

**Level of course unit: Doctoral School**

**Course unit title: Organoids use in science and medicine**

**Course unit code:**

**Type of course unit:**

**Course aims:**

**Familiarization with known, available and experimentally used organoid models and their practical use.**

**Form of study: Stationary**

**Year of study:**

**Types of educational activities and number of hours allocated:**

Subject	Language course	Self-study	Lecture	Exercises	Laboratory	Seminar	Practical	e-learning	Profession practice	Other (what?)	ECTS points
						5					

**Number of ECTS credits allocated and their structure according to students' from of learning:**

## **Additional information:**

Name and surname of the person/instructors:  
dr hab. n. med. Aleksandra Piechota – Polańczyk

**Prerequisites:** Knowledge of English at B2 level required.

**Learning activities and teaching methods:** Oral presentation, multimedia presentation, panel, discussion.

**Course unit content:** Seminar (5h): organoids - definition, origin, culture conditions, methods of differentiation and identification, use in in vitro and in vivo research, application potential

## **Course objectives:**

### **Knowledge:**

BM1\_PO\_W01 Has advanced knowledge of selected facts, phenomena and theories in the field of basic medical and pharmaceutical sciences, chemical and biological sciences, mathematics and computer science

BM1\_PO\_W02 Knows at an advanced level the chemical and biological basis of cell functioning

BM1\_PO\_W03 Knows the concepts of physiology and pathophysiology, and understands the basic mechanisms of functional disorders of organisms

BM1\_PO\_W06 Has advanced knowledge of theories explaining the principles of functioning of prokaryotic and eukaryotic cells

BM1\_PO\_W09 Knows methods of cultivating plant and animal cells and the possibilities of their use in biotechnological processes.

BM1\_PO\_W14 Knows research techniques used in biological sciences and basic medical sciences  
P6S\_WG

BM1\_PO\_W19 Has knowledge of professional ethics in medical biotechnology, especially ethical and bioethical issues raised by the development and research of medical biotechnology

### **Attitudes and transferrable (generic) competencies:**

BM1\_PO\_U01 In accordance with acquired knowledge, plans and performs research tasks using analytical methods, computer simulations and basic industrial techniques

BM1\_PO\_U02 Is able to formulate and solve research problems, including unusual ones and those related to unusual conditions of biological, chemical or technological processes

BM1\_PO\_U03 Is able to select appropriate sources of information and critically analyze them

BM1\_PO\_U07 Uses and integrates information obtained from literature and electronic databases, analyzes, interprets and critically evaluates them

BM1\_PO\_U10 Demonstrates the ability to synthesize and draw correct conclusions based on data from various sources

### **Required and recommended learning resources (readings):**

BM1\_PO\_K01 Speaks English at B2+ level in the field of biomedical sciences, especially medicine, biology and biotechnology, clinical trials and drug production

BM1\_PO\_K02 Is able to critically assess the usefulness and possibility of using new results in the field of biological sciences and basic medical and pharmaceutical sciences, biotechnology and bioinformatics

BM1\_PO\_K04 Is able to communicate with specialists in the field of biological sciences and basic medical and pharmaceutical sciences, biotechnology and bioinformatics using specialized terminology

BM1\_PO\_K05 Fulfills obligations towards society and works for the public interest in further scientific or professional career

BM1\_PO\_K06 Critically evaluates one's knowledge and knows when to turn to experts in case of difficulties in solving a research problem on one's own

BM1\_PO\_K07 Knows how to solve moral dilemmas in professional practice, or at least is able to

**Additional information:**

specify and explain them. Identifies and solves ethical dilemmas while maintaining the principles of professional ethics

**Required:**

1. Kim, J., Koo, BK. & Knoblich, J.A. Human organoids: model systems for human biology and medicine. *Nat Rev Mol Cell Biol* **21**, 571–584 (2020). <https://doi.org/10.1038/s41580-020-0259-3>
2. Li et al. Organoid based personalized medicine: from bench to bedside *Cell Regen.* 2020 9: 21.doi: [10.1186/s13619-020-00059-z](https://doi.org/10.1186/s13619-020-00059-z)
3. Shariati, L, Esmaeili, Y, Haghjooy Javanmard, S, Bidram, E, Amini, A. Organoid technology: Current standing and future perspectives. *Stem Cells.* 2021; 39: 1625–1649. <https://doi.org/10.1002/stem.3379>

**Recommended:****Assessment methods and criteria:****Statement and signature of the course leader:****Dean's signature:****Data:**