



SZKOŁA GŁÓWNA
GOSPODARSTWA
WIEJSKIEGO

Primary cell cultures in veterinary research

Educational subject description sheet

Basic information

Field of study Veterinary Medicine	Didactic cycle 2023/24	
Speciality -	Subject code WETFVMS_D.520.01717.23	
Organizational unit Faculty of Veterinary Medicine	Lecture languages english	
Study level long-cycle	Mandatory Elective subjects	
Study form full-time studies	Block Basic subjects	
Education profile General academic	Disciplines Veterinary medicine	
Coordinator	Anna Słońska-Zielonka	
Teacher	Anna Słońska-Zielonka, Joanna Cymerys-Bulenda	
Period Semester 6	Examination Pass with grade	Number of ECTS points 1
	Activities and hours Laboratory exercises: 15	

Goals

Code	Goal
C1	To familiarize students with the types of cell cultures, with particular emphasis on the differences between primary cell cultures and established cell lines. Transfer of knowledge about two-dimensional (2D) and three-dimensional (3D) cell culture systems.
C2	Familiarize students with the isolation and culture methods of various types of primary cells (neurons, astrocytes, microglia, fibroblasts) and make students aware of the most common problems related to cell culture.
C3	Transfer of knowledge about the possibilities of application of primary cell cultures in veterinary research, particularly in virological research.

Entry requirements

Cell biology, Veterinary microbiology module 1 and 2.

Knowledge and understanding of cell biology and basic knowledge in other natural sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge - Student knows and understands:			
W1	primary cell culture techniques and understand its applications.	A.W1	Written credit
Skills - Student can:			
U1	conduct hands-on experiments and research using primary cell cultures.	A.U2	Written credit
Social competences - Student is ready to:			
K1	use the primary cell cultures as an excellent research tool that can be used in veterinary research.	KS.1, KS.8	Written credit

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Topic 1: Types of cell cultures, differences between primary cell cultures, and established cell lines. Basic cell culture techniques. Topic 2: Two-dimensional (2D) and three-dimensional (3D) cell culture systems. The most common cell culture problems. Topic 3: Methods of isolation and culture of different types of primary cells (neurons, astrocytes, microglia, fibroblasts). The use of primary cell cultures in veterinary research, particularly in virological research.	W1, U1, K1	Laboratory exercises

No.	Course content	Subject's learning outcomes	Activities
2.	Topic 1: Establishing a primary culture of nerve cells. Basic cell culture techniques (monitoring cell growth, cell density and viability, sub-culturing, cell counting) and preparation of the culture for applications in virological research. Topic 2.: Establishing a culture of primary fibroblasts from a chicken embryo. Topic 3: Immunofluorescent staining of viral antigen in primary culture of neurons infected with equine herpesvirus type 1 (EHV-1) and observation using a confocal microscope.	W1, U1, K1	Laboratory exercises

Course advanced

Activities	Methods of conducting classes
Laboratory exercises	Lecture, Laboratory (experiment), learning by experiment

Activities	Examination method	Percentage
Laboratory exercises	Written credit	100%

Activities	Credit conditions
Laboratory exercises	During the written credit, the student can receive 20 points: 10 points for questions related to the knowledge obtained during lectures and 10 points for questions concerning skills and knowledge acquired during laboratory exercises. The second credit in the same form. The student has the right to 20% absence during classes, except for practical classes. No additional assessment methods are foreseen.

Literature

Obligatory

1. Mouse cell culture. Methods in Molecular Biology. Andrew Ward, David Tosh. Humana Press 2010.
2. Cell Culture Technology. Cornelia Kasper, Verena Charwat, Antonina Lavrentieva, ISBN : 978-3-319-74853-5, 2018
<https://link.springer.com/book/10.1007/978-3-319-74854-2>
3. Materials provided by teacher e.g. isolation of primary murine neurons protocol.

Optional

1. Establishment of Tumor Cell Lines: From Primary Tumor Cells to a Tumor Cell Line, Chapter in Cell Culture Technology, Katharina Meditz & Beate Rinner, SBN : 978-3-319-74853-5, 2018
https://link.springer.com/chapter/10.1007/978-3-319-74854-2_4

Calculation of ECTS points

Activity form	Activity hours*
Laboratory exercises	15
Preparation for the exam	15

Student workload	Hours 30
Number of ECTS points	ECTS 1

* hour means 45 minutes

Effects

Code	Content
KS.1	Absolwent jest gotów do wykazywania odpowiedzialności za podejmowane decyzje wobec ludzi, zwierząt i środowiska przyrodniczego
KS.8	Absolwent jest gotów do pogłębiania wiedzy i doskonalenia umiejętności
A.U2	Absolwent potrafi posługiwać się podstawowymi technikami laboratoryjnymi, takimi jak: analiza jakościowa, miareczkowanie, kolorymetria, pehametria, chromatografia oraz elektroforeza białek i kwasów nukleinowych
A.W1	Absolwent zna i rozumie strukturę organizmu zwierzęcego: komórek, tkanek, narządów i układów