

Module title:	Primary cell cultures in veterinary research	ECTS	1
Polish translation:	Kultury pierwotne komórek w doświadczeniach weterynaryjnych		
Course:	Veterinary Medicine		

Module language: English		Stage: JM-FVM	
Form of studies: <input checked="" type="checkbox"/> intramural <input type="checkbox"/> extramural	Type of module: <input checked="" type="checkbox"/> basic <input type="checkbox"/> directional	<input type="checkbox"/> mandatory <input checked="" type="checkbox"/> elective	Semester: 6 <input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester
Academic year:		Intake 2022/2023	Catalogue number: FVM-V-JMSS-06S- EB02_20

Module coordinator:	Dr Anna Słońska-Zielonka			
Teachers responsible for the module:	<ul style="list-style-type: none"> <li>Dr Anna Słońska-Zielonka (other specialists in the field of study, Institute of Veterinary Medicine; Department of Preclinical Sciences).</li> <li>Dr hab. Joanna Cymerys-Bulenda (academic teacher of the Institute of Veterinary Medicine; Department of Preclinical Sciences).</li> </ul> <b>Academic teachers of the Institute of Veterinary Medicine; Department of Preclinical Sciences; PhD students in accordance to the internal legal acts</b>			
Objectives of the module:	<p>The course is divided into two parts: a) lectures and b) practical classes.</p> <p>During the lectures students are receiving advanced information about primary cell cultures and about the possibilities of their application in veterinary research. Students learn how do primary cell cultures differ from cell lines and how to isolate and culture, different types of primary cells (neurons, astrocytes, microglia, fibroblasts etc.). Additionally, students learn about differences between two-dimensional (2D) and three-dimensional (3D) cell cultures systems. The basic knowledge about modern techniques of visualization (confocal microscopy) and monitoring of cell growth, density and viability (xCELLigence, JuLI™ Br Live Cell Analyzer) is also provided. During practical classes students learn how to isolate primary nerve cells and fibroblasts and they conduct experiments which enable them to understand applications of primary cell cultures in veterinary research.</p>			
Teaching forms, number of hours:	a) Lectures; hours 6; b) Laboratory classes; hours 9;			
Teaching methods:	a) Multimedia lectures. b) Laboratory classes/ participation in laboratory research.  Detailed schedule will be defined by the coordinator of the course at the beginning of semester. Detailed organization of consultations will be defined by the coordinator of the course at the beginning of semester.			
Formal prerequisites and initial requirements:	Cell biology, Veterinary microbiology module 1 and 2 Knowledge and understanding of cell biology and basic knowledge in other natural sciences, Veterinary pharmacology 1 Pathomorphology 1			
Learning effects	Course outcomes:	Learning outcomes relative to the course outcomes	Impact on the course outcomes*	
Knowledge:	1	Student is equipped with fundamental knowledge in primary cell culture techniques and understands it's their applications.	A.W.1	3
	2			
Skills:	1	Student is able to conduct hands-on experiments and research using primary cell cultures.	A.U.2	3
	2			
Competences:	1	Student is aware of the primary cell cultures are an excellent research tool that can be used in veterinary research.	KS.8	2
	2			

Objectives of the module required to obtain learning effects:	<p>Aim of the course is:</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Transfer of knowledge about the possibilities of application of primary cell cultures in veterinary research, particularly in virological research.</li> </ol>																								
Assessment methods:	<p>Written credit. In case of unforeseen, unusual circumstances mandatory remote teaching and remote assessment methods might be adopted.</p>																								
Detail description of assessment methods;  Formal documentation of learning outcome:	<p>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. Student has the right to 20% absences during the course, with the exception of practical classes. No extra assessment methods are anticipated.</p> <p>eHMS entry. Records collected in the course portfolio i.e. individual records of student results, presence lists, database of oral and written questions, written assessments of the students.</p>																								
Elements impelling final grade:	<p>The final grade consists of: 50% from the test regarding knowledge provided during lectures 50% from the test regarding knowledge provided during practical classes</p> <table border="1"> <thead> <tr> <th>points</th> <th colspan="2">grade</th> </tr> </thead> <tbody> <tr> <td>10 and below</td> <td>2</td> <td>failed</td> </tr> <tr> <td>10.5-12</td> <td>3</td> <td>sufficient</td> </tr> <tr> <td>12.5-14</td> <td>3.5</td> <td>sufficient plus</td> </tr> <tr> <td>14.5-16</td> <td>4</td> <td>good</td> </tr> <tr> <td>16.5-18</td> <td>4.5</td> <td>very good</td> </tr> <tr> <td>18.5-20</td> <td>5</td> <td>excellent</td> </tr> </tbody> </table>				points	grade		10 and below	2	failed	10.5-12	3	sufficient	12.5-14	3.5	sufficient plus	14.5-16	4	good	16.5-18	4.5	very good	18.5-20	5	excellent
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Teaching base:	Classrooms and laboratories of the Department of Preclinical Sciences, IVM																								
Mandatory and supportive materials :	<p>Obligatory</p> <ol style="list-style-type: none"> <li>Mouse cell culture. Methods in Molecular Biology. Andrew Ward, David Tosh. Humana Press 2010.</li> <li>Cell Culture Technology. Cornelia Kasper, Verena Charwat, Antonina Lavrentieva, ISBN : 978-3-319-74853-5, 2018 <a href="https://link.springer.com/book/10.1007/978-3-319-74854-2">https://link.springer.com/book/10.1007/978-3-319-74854-2</a></li> <li>Materials provided by teacher e.g. isolation of primary murine neurons protocol.</li> </ol> <p>Optional</p> <ol style="list-style-type: none"> <li>Establishment of Tumor Cell Lines: From Primary Tumor Cells to a Tumor Cell Line, Chapter in Cell Culture Technology, Katharina Meditz &amp; Beate Rinner, SBN : 978-3-319-74853-5, 2018 <a href="https://link.springer.com/chapter/10.1007/978-3-319-74854-2_4">https://link.springer.com/chapter/10.1007/978-3-319-74854-2_4</a></li> </ol> <p>Relevant scientific publications including those of the module coordinator.</p>																								
ANNOTATIONS	<p>Maximum number of students in a group: 8; 2 groups per semester</p>																								

\* 3 – complete and detailed, 2 – moderate, 1 – basic.

Quantitative summary of the module:

Estimated number of work hours per student (contact and self-study) essential to achieve presumed learning outcomes of the module - base for quantifying ECTS:	<b>15 h</b>
Total ECTS points, accumulated by students during contact learning:	<b>1 ECTS</b>