

Module title:	Translational Medicine	ECTS	4
Polish translation:	Medycyna Translacyjna		
Course:	Veterinary Medicine		

Module language:	English	Stage:	JM
Form of studies:	☒ intramural ☐ extramural	Type of module:	☐ basic ☒ directional ☐ mandatory ☒ elective
		Semester:	09 ☒ winter semester ☐ summer semester
Academic year:		2021/2022	Catalogue number: ...

Module coordinator:	Prof. Zdzisław Gajewski Dr Sc; Karolina Ferenc PhD, DVM
Teachers responsible for the module:	Academic teachers of Center for Translational Medicine (CMT), PhD students, visiting professors and other specialists in the field of study
Unit responsible for the module:	Center for Translational Medicine (CMT)
Faculty in charge:	Faculty of Veterinary Medicine (FVM)
Objectives of the module:	Translational medicine is an interdisciplinary field of science aimed at effectively transferring discoveries from basic research into clinical practice, as well as identifying clinical problems that require in-depth laboratory investigation. The objective of this course is to introduce students to modern strategies and tools used in the process of knowledge translation. The course will help students understand how the process "from bench to bedside" takes place and what regulatory and organizational challenges are associated with the implementation of medical innovations in everyday practice. This subject prepares students for careers in scientific research, clinical settings, and the pharmaceutical industry, particularly in the development and implementation of new drug formulations or medical devices for both veterinary and human medicine. <u>Lectures:</u> Introduction to translational medicine: definition, goals, and methods of operation. Legal regulations related to conducting scientific research involving animals. Animal models in experiments – factors determining the choice of model for biomedical research. Differences between clinical procedures and scientific/educational experiments. Introduction to clinical trials – concepts and principles of each clinical trial phase. <u>Laboratory exercises:</u> The role of the veterinarian in animal-based research, review of current research activities at CMT. Advantages and disadvantages of research using cell and organ models; interpretation of results from in vitro and ex vivo studies. Conditions for housing laboratory animals in experiments. Planning an experiment using animal material as a model of human diseases, including both small and large animal models. Data collection and analysis in experimental studies involving animals. Designing an experiment aimed at solving a specific scientific problem, taking into account the research model, number of animals, experimental protocol, and suggested analyses of biological material. Interpretation of scientific data for use in clinical practice. <u>Clinical exercises:</u> Collection and preparation of biological material for research. Securing biological samples. Performing procedures on isolated tissues/organs.
Teaching forms, number of hours:	Lectures: 10 hours Laboratory exercises: 45 hours Clinical exercises: 30 hours
Teaching methods:	Original multimedia presentations, utilizing photographic and video materials. Laboratory exercises in labs equipped with apparatus necessary for sample collection, cell culture, tissue storage, performing physico-chemical analyses, etc., using consumable equipment. Preparation of a project/presentation on the application of regenerative medicine techniques/methods in clinical practice or solving a specific scientific problem – presentation and defense of the project based on data/materials available in scientific literature. Consultations outside of regular classes. The organization of consultations will be determined by the course coordinator at the beginning of the semester.

Formal prerequisites and initial requirements:	The student possesses the knowledge and skills acquired through the completion of core subjects in the semesters preceding the Translational Medicine module. Completed subjects: Histology and Embryology, Cell Biology, Biophysics, Chemistry, Biochemistry, Animal Physiology, Pathophysiology, Immunology.		
Learning outcomes:	Knowledge: 01 – The student is familiar with the applicable legal acts regulating the manufacturing and quality control of medicinal products and medical devices intended for use in animals and humans. 02 – The student understands the principles of working with biological materials (tissues, cells, organs). 03 – The student is familiar with surgical techniques and the operating principles of equipment specific to experimental surgery.	Skills: 04 – The student is able to select appropriate research techniques and in vitro/in vivo models to achieve a defined scientific objective. 05 – The student is able to conduct scientific research in accordance with the 3Rs principle (Replacement, Reduction, Refinement).	Competences: 06 – The student develops competences in critically evaluating their own knowledge and using scientific sources to expand it. 07 – The student develops competences in sharing knowledge and skills with others.
Assessment methods:	Effects 03-07 evaluation of the project task and report, effects 01-03 evaluation of student activity in classes. The project task is evaluated based on the relevance of content to the assigned topic, logical reasoning, formulation of rational solutions, ability to engage in discussion, and responses to questions. Assessment also includes the level of student preparation and participation during classes, as well as the quality and completeness of the exercise report. In the case of a top-down suspension of the realization of classes at the University and the need for remote/hybrid teaching, other forms of verification of learning outcomes are permitted in a manner adequate to the situation.		
Formal documentation of learning outcomes:	Record into the eHMS system and documentation contained in the 'Course File' (i.e. student assessment cards, attendance lists, students' essays).		
Elements impelling final grade:	A student who has not obtained a minimum acceptable number of points or not submit a project task does not obtain credit for the course. The final course grade is influenced by the following elements: - evaluation of completion of the project task, - evaluation of completion of the classes report - evaluation of student activity in class.		
Teaching base:	Lecture and exercise rooms at the CMT and FVM, laboratories.		
Literature: 1. „Translational Medicine and Drug Discovery“. Authors: R. Krishna, BH. Littman. Wydawca: Cambridge University Press, 2011. 2. „Translational Medicine: Tools And Techniques“. Editor: Academic Press, 2015, ed. 3. 3. „Principles of Translational Science in Medicine, From Bench to Bedside“. Author: M Wehling. Editor Acedemic Press, 2015, ed. 2. 4. Relevant scientific publications in the field of course, including those recommended by the module coordinators.			

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:	100
Total ECTS points, accumulated by students during contact learning:	3

Learning outcomes of the module relative to the learning outcomes of the subject:

Outcome category	Learning outcomes:	Learning outcomes relative to the course outcomes	Impact on the each for course outcomes
Knowledge	01 – The student is familiar with the applicable legal acts regulating the manufacturing and quality control of medicinal products and medical devices intended for use in animals and humans.	B.W7; B.W9	Each 3

Knowledge	02 – The student understands the principles of working with biological materials (tissues, cells, organs).	B.W5; B.W4; B.W16	Each 3
Knowledge	03 – The student is familiar with surgical techniques and the operating principles of equipment specific to experimental surgery.	B.W4	Each 2
Skills	04 – The student is able to select appropriate research techniques and in vitro/in vivo models to achieve a defined scientific objective.	B.U2, B.U3, B.U6, B.U7	Each 3
Skills	05 – The student is able to conduct scientific research in accordance with the 3Rs principle (Replacement, Reduction, Refinement).	B.U1. B.U11, B.U12, B.U14 B.U15	Each 3
Competences	06 – The student develops competences in critically evaluating their own knowledge and using scientific sources to expand it	KS.4	3
Competences	07 – The student develops competences in sharing knowledge and skills with others.	KS.6	2