



Summer Semester												
Direct (contact) education						20						6
Online learning (synchronous)												
Distance learning (asynchronous)												
TOTAL per year:												
Direct (contact) education						20						6
Online learning (synchronous)												
Distance learning (asynchronous)												
Educational objectives (max. 6 items) C1. Knowledge of main trends of genetic and cellular therapy. C2. Understanding of actions of DNA vaccines. C3. Ability to plan the construction of expression plasmid vector with established therapeutic gene. C4. Understanding of pharmacogenetics and personal pharmacotherapy. Gaining practical SNP analysis performing skills. C5. Understanding epigenetics influence on the level of gene expression and knowledge of molecular techniques for their investigations. C6. Introduction to cell culture methods.												
Education result matrix for module/course in relation to verification methods of the intended education result and the type of class												
Number of course education result	Number of major education result	Student who completes the module/course knows/is able to	Methods of verification of intended education results (forming and summarising)	Form of didactic class <i>**enter the abbreviation</i>								
K 01	C.W9	understands principles of DNA cloning, describes following steps of the process	Evaluation of student's oral response.	LC, SS								
K 02	C.W40	understands the concept of pharmacogenetics and principles of personal therapy; describes techniques of SNP detection;										
K 03	C.W41	knows main trends in development of genetic and cellular, and target therapy in specific diseases; is able to assess advantages and disadvantages of gene therapy application; describes the mechanism of actions of DNA vaccines; understands RNA interference and is able to use it in gene therapy;										



U01	B.U08.	Use the basic laboratory techniques like quality measurements, colorimetry, chromatography, electrophoresis of nucleic acids and proteins	Evaluation of student's practical competency and involvement.	LC, SS
U02	B.U10	uses databases, including website databases, and searches for the necessary information using available tools;		
U03	B.U13.	Know how to design, perform and interpret the scientific study and draw the conclusions.		

** L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning .

Please mark on scale 1-5 how the above effects place your classes in the following categories:

communication of knowledge, skills or forming attitudes:

Knowledge: 3

Skills: 5

Student's amount of work (balance of ECTS points)

Student's workload (class participation, activity, preparation, etc.)	Student Workload (h)
1. Contact hours:	20
2. Online learning hours (e-learning):	
3. Student's own work (self-study):	6
Total student's workload	26
ECTS points for module/course	1
Comments	

Content of classes (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)

Lectures

- 1.
- 2.
- 3.

Seminars

- 1.
- 2.
- 3.

Practical classes

1. Introduction to gene therapy. Stages of gene cloning. Working with gene databases, restrictive analysis, PCR primers designing (3 h)
2. Gene therapy application in oncology and cardio-vascular diseases. Construction of expression vector part 1. RNA isolation, RT-PCR (3 h)
3. Construction of expression vector part 2. Digestion of PCR product with restriction endonucleases, ligation, transformation (3 h).
4. DNA vaccines application. Construction of expression vector part 3. Plasmid DNA isolation from bacteria. Indication of DNA concentration (3 h).



<p>5. Cellular therapy. Cell culture basic methods. Methods of DNA delivery into cells. Construction of expression vector part 4 Restrictive analysis of obtained DNA (3 h).</p> <p>6. Epigenetic regulation of gene expression. microRNA application in gene therapy and diagnosis. Algorithms and calculation of gene expression in real-time PCR technique. Construction of expression vector part 5. Electrophoresis, summary of cloning results (3 h)</p> <p>7. Pharmacogenetics. SNP detection methods and analysis of results. Summary of the course (2 h).</p>													
<p>Other</p> <p>1.</p>													
<p>Basic literature (list according to importance, no more than 3 items)</p> <p>1. Herzog R.W., Zolotukhin S. <i>A guide to human gene therapy</i>. World Scientific Publishing Co, Singapore 2010.</p> <p>2. Lattime E.C, Gerson S.L. <i>Gene therapy of cancer</i>. Elsevier Academic Press, Third edition 2014</p> <p>3. Barnes L.P. <i>New research on pharmacogenetics</i>. Nova Science Publishers, Inc, New York 2007</p> <p>Additional literature and other materials (no more than 3 items)</p> <p>1. Scientific articles- provided by the teacher</p>													
<p>Didactic resources requirements (e.g. laboratory, multimedia projector, other...)</p> <p>Laboratory, cell culture room, laminar chamber, incubator-CO₂, fluorescence microscope, multimedia projector, laptops, thermocycler, real-time thermocycler, centrifuge, thermoblok, UV-transiluminator</p>													
<p>Preliminary conditions (minimum requirements to be met by the student before starting the module/course)</p> <p>Sign up for the list. Basic knowledge of genetic</p>													
<p>Conditions to receive credit for the course</p> <p>To receive credit for the course student is obligated to be present at 100% of classes or any absence must be made up by preparing assay discussing the topic chosen by the student. Each absence must be made up, including rector's days or dean's hours.</p> <p>The course is ended by a one-choice test. The mark received at the end of the course will be estimated based on a number of positive answers as presented in the table below.</p>													
<table border="1"> <thead> <tr> <th>Grade:</th> <th>Criteria for course</th> </tr> </thead> <tbody> <tr> <td>Very Good (5.0)</td> <td>100%-93%</td> </tr> <tr> <td>Good Plus (4.5)</td> <td>92,9%-85%</td> </tr> <tr> <td>Good (4.0)</td> <td>87,9%-78%</td> </tr> <tr> <td>Satisfactory Plus (3.5)</td> <td>77,9%-70%</td> </tr> <tr> <td>Satisfactory (3.0)</td> <td>69,9%-60%</td> </tr> </tbody> </table>		Grade:	Criteria for course	Very Good (5.0)	100%-93%	Good Plus (4.5)	92,9%-85%	Good (4.0)	87,9%-78%	Satisfactory Plus (3.5)	77,9%-70%	Satisfactory (3.0)	69,9%-60%
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Satisfactory (3.0)	
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Name of unit teaching course:	Molecular Techniques Unit
Address	ul. M. Skłodowskiej-Curie 52 , 50-369 Wrocław
Phone	71 7841588
E-mail	anna.karpiewska@umed.wroc.pl

Person responsible for course:	Dr Małgorzata Małodobra-Mazur
Phone	71 7841595
E-mail	malgorzata.malodobra-mazur@umed.wroc.pl

<i>List of persons conducting specific classes:</i>	<i>degree/scientific or professional title</i>	<i>Discipline</i>	<i>Performer profession</i>	<i>Form of classes</i>
Małgorzata Małodobra-Mazur	PhD	molecular biology	Adiunkt	laboratory classes

Date of Syllabus development

Syllabus developed by

22.03.2021

Dr Małgorzata Małodobra-Mazur

Signature of Faculty Dean

Wrocław Medical University
Faculty of Medicine
Vice-Dean for Biomedical Studies
[Signature]
prof. Beata Szmajdzińska, PhD

Signature of Head of teaching unit

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