



## Propaedeutics of molecular biology

<b>1. IMPRINT</b>	
<b>Academic Year</b>	2020/2021
<b>Faculty</b>	English Division
<b>Field of study</b>	Medicine
<b>Main scientific discipline</b> <i>(in accord with appendix to the Regulation of Minister of Science and Higher education from 26th of July 2019)</i>	<b>Medical sciences</b>
<b>Study Profile</b> <i>(general academic / practical)</i>	General academic
<b>Level of studies</b> <i>(1<sup>st</sup> level / 2<sup>nd</sup> level / uniform MSc)</i>	Uniform MSc
<b>Form of studies</b>	<b>Stationary</b>
<b>Type of module / course</b> <i>(obligatory / non-compulsory)</i>	<b>Obligatory</b>
<b>Form of verification of learning outcomes</b> <i>(exam / completion)</i>	<b>Completion test</b>
<b>Educational Unit / Educational Units</b> <i>(and address / addresses of unit / units)</i>	Department of General Biology and Parasitology, 5 Chałubińskiego Str., 02-004 Warsaw, tel. (22) 6212607, e-mail: biologia@wum.edu.pl

<b>Head of Educational Unit / Heads of Educational Units</b>	<b>Ph.D., Associate Professor, Daniel Młocicki</b>
<b>Course coordinator</b> (title, First Name, Last Name, contact)	<b>Ph.D., Associate Professor, Monika Dybicz, monika.dybicz@wum.edu.pl</b>
<b>Person responsible for syllabus</b> (First name, Last Name and contact for the person to whom any objections concerning syllabus should be reported)	<b>Monika Dybicz, monika.dybicz@wum.edu.pl</b>
<b>Teachers</b>	<b>Monika Dybicz, Aleksandra Sędzikowska, Julia Dąbrowska, Agnieszka Sobczyk-Kopcioł</b>

<b>2. BASIC INFORMATION</b>			
<b>Year and semester of studies</b>	1 <sup>st</sup> year, 1st semester	<b>Number of ECTS credits</b>	2.00
<b>FORMS OF CLASSES</b>		<b>Number of hours</b>	<b>ECTS credits calculation</b>
<b>Contacting hours with academic teacher</b>			
Lecture (L)			
Seminar (S)		5	0.30
Discussions (D)			
e-learning (e-L)			
Practical classes (PC)		15	1.00
Work placement (WP)			
<b>Unassisted student's work</b>			
Preparation for classes and completions		10	0.70

<b>3. COURSE OBJECTIVES</b>	
O1	The objective is to provide knowledge which enable medical students to have a broad view of molecular biology.
O2	The subject focuses on broad base of knowledge about the genome, molecular mechanisms of cell processes and expression of genetic information in humans.
O3	The performance of fundamental molecular techniques.

**4. STANDARDS OF LEARNING – DETAILED DESCRIPTION OF EFFECTS OF LEARNING** (concerns fields of study regulated by the Regulation of Minister of Science and Higher Education from 26 of July 2019; does not apply to other fields of study)

<p><b>Code and number of effect of learning in accordance with standards of learning</b> (in accordance with appendix to the Regulation of Minister of Science and Higher education from 26th of July 2019)</p>	<p><b>Effects in time</b></p>
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**Knowledge – Graduate\* knows and understands:**

B.W13	performance of fundamental molecular techniques..
B.W14	Functions of the genome, transcriptome and basic methods used in their study, processes of DNA replication, repair and recombination, transcription, translation and DNA, RNA degradation, and concepts of gene expression regulation.
C.W10	Benefits and risks considering GMO presence in ecosystem.

**Skills– Graduate\* is able to:**

B.U8	Use basic techniques applied in molecular biology, e.g. PCR, RFLP, nucleic acids electrophoresis.
B.U9	Support simple measuring apparatus and assess the accuracy of measurements.
B.U13	Plan and perform simple scientific research and interpret their results and conclude.

\* In appendix to the Regulation of Minister of Science and Higher education from 26th of July 2019 „graduate”, not student is mentioned.

**5. ADDITIONAL EFFECTS OF LEARNING** (non-compulsory)

<p><b>Number of effect of learning</b></p>	<p><b>Effects of learning in time</b></p>
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**Knowledge – Graduate knows and understands:**

K1	Fundamental molecular techniques.
K2	The principles of conducting scientific, observational and experimental research and disseminating their results.

**Skills– Graduate is able to:**

S1	Plan own educational activity and constantly improve education to update knowledge.
S2	Interpret the basic results of molecular studies and critically assesses their results in correlation with the possibility of a genetic disease in a patient.
S3	Communicate with colleagues in the team and share knowledge.

**Social Competencies – Graduate is ready for:**

SC1	Continuous improve education connected with the expansive molecular biology development.
SC2	Use of objective sources of information.
SC3	Formulation conclusions from own measurements or observations.

**6. CLASSES**

Form of class	Class contents	Effects of Learning
Seminars	1. Human genome structure and function. 2. DNA and RNA structure and function. 3. DNA replication. 4. Transcription and translation, DNA repair and recombination, gene expression regulation. 5. Mutagenesis.	B.W13, B.W14
Practical classes	1. Basic rules of laboratory work. DNA extraction. 2. Continuation of DNA extraction. 3. <i>In vitro</i> DNA amplification (PCR and modifications). 4. RFLP and other molecular techniques. 5. Electrophoresis. 6. GMO (Genetically Modified Organisms). 7. Analysis of gene mutations determining the development.	B.W13, B.W14, C.W10

**7. LITERATURE**

**Obligatory**

1. Workbook: Molecular Biology - materials for 1st year students of English Division Medicine. Monika Dybicz, Aleksandra Sędzikowska. Oficyna Wydawnicza WUM, Warszawa, 2020.
2. Molecular Biology. Third Edition. David P. Clark, Nanette J. Pazdernik, Michelle R. McGehee. Elsevier, 2019.

**Supplementary**

1. Molecular Biology of the Gene. Seventh Edition. James. D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick. Cold Spring Harbor Laboratory Press, 2013.

**8. VERIFYING THE EFFECT OF LEARNING**

Code of the course effect of learning	Ways of verifying the effect of learning	Completion criterion
B.W13, B.W14, C.W10, B.U8, B.U9, B.U13	Multiple Choice Questions test	Over 54% correct answers
B.W13, B.W14, C.W10, B.U8, B.U9, B.U13	Completion of individual exercises based on the reports of the exercises in the workbook.	Correct record of results obtained during exercises and their proper interpretation.

**9. ADDITIONAL INFORMATION** (*information essential for the course instructor that are not included in the other part of the course syllabus e.g. if the course is related to scientific research, detailed description of, information about the Science Club*)

- 1) Students are required to attend all classes.
- 2) Students should be prepared for the subject of the particular class.
- 3) Absence from class is justified on the basis of a medical certificate or certificate of a random accident. The class should be done with another group after prior agreement with the person responsible for the subject.
- 4) Classes start on time, being late is treated as an absence (students are not allowed to enter the room).
- 5) Students should have the workbook "Molecular Biology - materials for 1st year students of English Division Medicine" - available for purchase at the WUM Publishing House (Oficyna Wydawnicza WUM, ul. Pawińskiego 3, 02-106 Warszawa).
- 6) Students should wear a lab coat and a lab gloves.
- 7) Persons applying for transfer of the subject from previous years or from another university should write an application to the Head of the Department of General Biology and Parasitology and obtain permission of the Dean.