MEDBIOT-05:	**MOLECULAR MEDICINE**
GENERAL INFORMATION	
Course Coordinator(s)	Teuta Opačak-Bernardi, PhD, Assist. Prof.
Associate(s)	Ljubica Glavaš-Obrovac, PhD, full prof. with tenure Stana Tokić, PhD, Assist. Prof. Marijana Jukić, PhD
Study Programme	Interdisciplinary Graduate Study Programme in English: Biotechnology
Course Status	Obligatory
Year of Study, Semester	2nd Year / 3rd Semester
Credits (ECTS)	**4**
Teaching Method (number of classes)	Lectures: 30; Seminars: 5; Exercises: 20
Expected Number of Students in the Course	25-30
COURSE DESCRIPTION	
Course Aims	
Aim of this course is to introduce the students with the basis of molecular biology, means of regulating gene expression and the connection between disease and changes in gene regulation. They will be introduced to the most recent discoveries about molecular and cellular mechanisms that can lead to a disease, including genetic and epigenetic factors. Students will also familiarise themselves with the newest methods in molecular diagnostics and advances in molecular therapeutic approaches.	
Prerequisites for Enrolment and the Entry Competencies Required for the Course	
Completed and passed course of Molecular biology with genetic engineering and Genetics and genomics	
Learning Outcomes at the Programme Level Contributed by the Course	
MEDBIOT-2; MEDBIOT-3; MEDBIOT-5; BIOTECH-6; BIOTECH-7; BIOTECH-10	
Learning Outcomes at the Course Level	
After completing the course, the student will be able to: 1. Compare the role of main cellular mechanisms in the development of a disease. 2. Rank the genetic and epigenetic elements responsible for regulating the key genetic responses to changes in diseased states. 3. Explain the connection between a person's genetic profile and their susceptibility to disease and response to therapy 4. Choose the appropriate molecular diagnostic method according to set parameters. 5. Critically evaluate approaches that use molecular changes in therapeutic approaches. 6. Qualitatively and quantitatively analyse biologic samples implementing appropriate research methods. 7. Critically evaluate the results of different studies available in scientific literature.	
Course Content	
DNA structure and maintaining sequence. Transcription and translation. Regulation of gene expression. Epigenetics. Post translational modifications. What is molecular medicine? Development of molecular medicine. SNPs and their effect on gene regulation. SNP profile analysis. Monogenetic diseases. Polygenetic diseases. Molecular diagnostics – methods and applications. Analysis of gene expression. The role of non-coding sequences and snRNA in modification of gene expression. Molecular therapeutic approaches. Recombinant medications. Stem cells and cell-based therapy. Basis of gene therapy. Molecular medicine in everyday clinical practice. Ethics in molecular medicine.	
Teaching Methods	

Lectures; seminars; laboratory exercises

Students' Obligations

Attendance at all forms of classes is mandatory and the students are obligated to attend all knowledge tests. The students may be absent from 30% (full-time students) and 50% (part-time students) of each of the forms of classes, provided that the absence is justified. An exercise or a seminar which has not been completed must be made up through a midterm exam.

Monitoring the Activity of the Students *(Connecting Learning Outcomes, Teaching Methods, and Grading)*

Class-related activity	ECTS	Learning outcome	Student activity	Evaluation method	Grade points	
					Min.	Max.
Attending classes			Attendance at classes	Keeping records	5	10
Lectures,	0.5	1-5,7		Presentations	5	15
Seminars	0.5		Seminars			
Laboratory practice	0.5	4,6	Practical work	Lab notes	10	25
Final exam	2.5	1-7	Studying for the final exam	Written exam	30	50
Total	**4**				**50**	**100**

Evaluation of the written part of the final exam:

Percentage of correct answers (%)	Grade
>95.00	50
90.00-94.99	47
85.00-89.99	45
80.00-84.99	40
75.00-79.99	38
70.00-74.99	35
65.00-69.99	33
60.00-64.99	30

Forming the final grade:
The points granted for the final exam are added to the grade points awarded during class attendance. The grading process is conducted by absolute distribution, i.e. based on total achievements, and compared to the numerical system in the following manner:
A – Excellent (5): 90-100 grade points; B – Very Good (4): 80-89.99 grade points; C – Good (3): 65-79.99 grade points; D – sufficient (2): 50-64.99 grade points.

Mandatory Literature (available in the library and via other media)

Title	Number of copies in the library	Availability via other media
Kurreck J, Stein CA: Molecular Medicine: An Introduction. Wiley-Blackwell, 2016.		yes

Additional Literature

Timothy M. Cox, John Sinclair: The Molecular Biology in Medicine (Wiley-Blackwell), 1997.

Quality Assurance Procedures Designed to Ensure the Acquisition of Outcomes and

Competencies
Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Medicine Osijek and/or the Faculty of Food Technology Osijek.
Note
E-learning is not included in the class quota, but it is used in teaching and it contains links to various sites and video and audio materials available on websites.