

MOLECULAR AND CELL BIOLOGY IN CLINICAL PRACTICE	
GENERAL INFORMATION	
Course coordinator	Professor Marija Heffer, MD, PhD
Assistant/Associate	Asst. Prof. Vedrana Ivić, PhD Marta Balog PhD
Study Programme	Integrated undergraduate and graduate university study of Medicine
Status of the course	Elective
Year of study, semester	1th year, 2nd semester
ECTS	2
Workload (hours)	Seminars (10); Exercises (15)
Expected number of students	30
COURSE DESCRIPTION	
Course objectives	
Strengthen the concept of molecular pathogenesis of the diseases using real cases of metabolic (nuclear lamina, lysosomal, peroxisomal and mitochondrial) and tumor diseases and develop an analytical way of making decisions on the diagnosis and personalized targeted therapy.	
Enrolment requirements and entry competencies	
Completed the course Medical Biology.	
Learning outcomes at the Programme level	
1.1, 3.5	
Learning outcomes (5-10)	
<p>After completing the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Draw the genealogy of families with autosomal dominant, autosomal recessive, sex-linked or mitochondrial disease and argue the possibility of polygenic disease. 2. Explain the basic diagnostic principles in determining metabolic diseases and discuss possible targeted therapy and ways to monitor its success. 3. To connect the clinical presentation of the disease with the molecular pathogenesis of the disease. 4. Explain the molecular pathogenesis of tumor growth, predict the effects of targeted therapy and propose the setting of a clinical study to determine how successful a new drug is. 5. Associate microbiome changes with the development of chronic diseases and suggest therapeutic measures. 	
Course content	
<p>Seminars Diagnosis of gene mutations on the example of cystic fibrosis. Colon cancer and DNA repair mechanisms. Cancer drugs targeting signaling receptors. Cancer drugs targeting oncogenes. Viruses and cancer. Beta-thalassemia. Alport's syndrome. Gene polymorphism and warfarin metabolism. Fabry's disease. Gene penetrance and manifestation of polygenic diseases.</p> <p>Exercises Mitochondrial and peroxisomal diseases. Inheritance of lysosomal diseases. Inheritance and diagnosis of peroxisomal diseases. Diseases of nuclear laminae. Microbiome as a basis for inflammatory bowel disease. Microbiome and development of neurodegenerative diseases. Principles of diagnosis of metabolic diseases.</p>	
Mode of teaching	

Seminars; Exercises						
Student obligations						
Attendance at all forms of classes is mandatory, and the student must access all knowledge tests. A student may justifiably miss 30% of each form of instruction. Unfinished exercise must be colloquial.						
Monitoring student work (alignment of learning outcomes, teaching methods and grading)						
Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Seminars	0.25	1-5	Participation in the discussion	Tracking activity	6	12
Excercises	0.75	1-3	Attendance and active participation in exercises	Exercise diary submitted and signed	14	28
Final exam	1	1-5	Learning for the written exam	Written exam	30	50
Total	2				50	100

Evaluation of the written part of the final exam:

Percentage of correct answers (%)	Grade points
60.00-69.99	30
70.00-79.99	35
80.00-89.99	40
90.00-94.99	45
95.00-100.00	50

Calculation of final grade:

Students who achieved 30 or more points in the final exam, the points obtained in the final exam are added to the grade points obtained during the class, and this sum constitutes the final grade. Since the study program schedule descriptive assessment of elective courses, the course coordinator awards the grade "passed" to a student who achieves 50 or more grade points in the course.

Required reading (available in the library and through other media)

Title	Number of copies in the library	Availability through other media
1. Geoffrey M. Cooper i Robert E. Hausman: Stanica-Molekularni pristup, 5. izdanje, Medicinska naklada, Zagreb, 2010.	14	

Additional reading
Descriptions of actual clinical cases from the Osijek Clinical Hospital used in teaching.
Course evaluation procedures
Anonymous, quantitative, standardized student survey on the subject and work of teachers conducted by the Office for Quality of the Medical Faculty Osijek.
Note /Other
E-learning is not included in the norm of subject hours, but it is used in teaching and contains links to various pages, video and audio materials available on the website.