

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	I		
Course title	Pain and genes – custom made pain treatment	Course code	MFMSEI01		
ECTS	1	Status	ELECTIVE		
Teaching hours		Lectures	Exercises	Seminars	Practice
		8	10	7	-
Teachers	Sandra Kostić, PhD, associate professor	8	10	7	
Course objectives	The objective of the course is to enable students to understand and adopt the basic concepts related to pain and personalized pain treatment based on the knowledge from areas of pharmacogenomics.				
Course learning outcomes	Learning outcome (LO) Student:			Course learning outcome code	LO code at the study program level
	- describes and explains the basic pain terminology and definitions (e.g. nociception, nociceptors, central and peripheral sensitization, allodynia, hyperalgesia...)			IU-MFMSEI-1	IU-MSE1
	- describes and explains the main difference between acute and chronic pain			IU-MFMSEI-2	IU-MSE2
	- describes and analyses methods, drugs and different approaches for the pain treatment available to patients today in specific clinical situations, (and describes the most relevant achievements in the field of pharmacogenomics and their therapeutic potential			IU-MFMSEI-3	IU-MSE6
	- describes and explains the examples from the scientific literature which point to the link between the gene-environment interaction and our pain tolerance			IU-MFMSEI-4	IU-MSE3
- describes the specific pain disorders which result from gene mutations, including congenital insensitivity to pain.			IU-MFMSEI-5	IU-MSE12	
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar				
Course content	Week / shift	Topic			
	Lectures	(L1) The basic pain terminology (e.g. nociception, nociceptors, central and peripheral sensitization, allodynia, hyperalgesia...), the main difference between acute and chronic pain (L2) Neurobiology and genetics of pain (L3) Pain genetics – from preclinical trials to clinic: Methods, drugs and different approaches for the pain treatment available to patients today (L4) Epigenetics – gene and environment interaction			
	Seminars	(S1) The most relevant achievements in the field of pharmacogenomics and their therapeutic potential – from preclinical trials to clinics (S2) Pharmacogenomics – the future of custom made pain treatment (S3) Congenital insensitivity to pain			
	Exercises	(E1) Specific pain disorders which result from gene mutations, including congenital insensitivity to pain, (E2) Pain research			
Language	English				
E-learning	Classes are conducted in person. If necessary, lectures, seminars and exercises can be combined (in person and online) or completely online via e-learning platforms (Google-Meet).				
Teaching methods	Teaching, interactive				
Types of assessment (indicate - Bold)					

Type of pre-examination obligation					Type of exam						
midterm	seminar paper	essay/report	practical/project task	other	written exam	oral exam	practical				
Allocation of ECTS credits and share in the grade											
Student obligations		Learning outcome code	Hours of workload	Share in ECTS	Share in grade						
Class attendance			25	0.8							
Seminar paper		IU-MFMSEI-3 IU-MFMSEI-4 IU-MFMSEI-5	2	0.1							
Written exam		IU-MFMSEI-1 IU-MFMSEI-2 IU-MFMSEI-3 IU-MFMSEI-4 IU-MFMSEI-5	3	0.1							
In total			30	1	100 %						
Method of calculating the final grade											
The final grade is descriptive, pass/fail. After completing the seminar work and the written exam, student will pass the course.											
Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	- Webster LR, Belfer I. Pharmacogenetics and Personalized Medicine in Pain Management. Clin Lab Med. 2016 Sep;36(3):493-506. doi: 10.1016/j.cl.2016.05.007. Epub 2016 Jun 22.		x		x				x		
	- Ko TM, Wong CS, Wu JY, Chen YT. Pharmacogenomics for personalized pain medicine. Acta Anaesthesiol Taiwan. Mar;54(1):24-30, 2016.		x		x				x		
	- Devor M: How Do Pain Genes Affect Pain Experience? In: Pain Genetics: Basic to Translational Science, First Edition. Editors: Belfer I and Diatchenko L. John Wiley & Sons, Inc., 1-14, 2014.		x		x				x		
Additional	- Mogil JS. Pain genetics: past, present and future. Trends Genet. 2012 Jun;28(6):258-66.		x		x				x		
Additional course information											