



Course ID: HDOB31	Course name: BIOMARKERS OF LIPID PEROXIDATION		
Cycle: THIRD	Year: FIRST	Semester: I	ECTS credits: 15
Course status: MANDATORY		Total course hours: 90 Lectures: 45 Laboratory: 45	
Teaching participants:	Teachers and associates with expertise in the field of lipid redox processes		
Prerequisite for enrollment:	-		
Course aims:	This course aims to familiarize students with the causes and consequences of lipid peroxidation (LP) in human body, as the most significant negative phenomenon of free radicals. Since LP is an autocatalytic and usually irreversible process, which can slow down with the antioxidants, its early detection is of great importance.		
Thematic course units:	The causes and mechanism of lipid peroxidation; Mechanisms of oxidative tissue damage (peroxidation of PUFAs, oxidation of thiol group of enzymes, the formation of cross-links between malondialdehyde and phospholipids or proteins, oxidative cleavage of DNA, etc.) and its destructive effects on membrane processes; Primary high reactive intermediates for the LP (alkyl radicals, conjugated dienes, peroxy and alkoxy radicals and lipid hydroperoxides); Secondary products of LP (short chain volatile hydrocarbons (ethane, ethene, pentane, aldehydes, ketones); The end products of LP (isoprostanes, malondialdehyde, 4-hydroxynonenal, 4,5-dihydroxydecenal etc.) as important mediators of atherosclerosis, coronary heart disease, acute myocardial infarction, rheumatoid arthritis, systemic sclerosis; Latest biomarkers of lipid peroxidation: malondialdehyde, 4-hydroxynonenal, 8-hydroxy-2-deoxyguanosine (8-OHdG) etc. Assessment		
Teaching methodology:			

Assessment methods and grading system¹:	Grading criteria		
	Criteria	Maximal score	Required score
	1. Class attendance		
	2. Class activities		
	3. Seminars	20	11
	4. Midterms	40	22
	5. Final exam	40	22
	Total	100	55
	Scores and grading		
	Score	Grade (B&H)	Grade (ECTS)
	< 55	5	F, FX
	55-64	6	E
65-74	7	D	
75-84	8	C	
85-94	9	B	
95-100	10	A	
Literature²:	<p>Mandatory literature:</p> <ol style="list-style-type: none"> Gerard-Monnier, D. (1997) Reactions of 1-methyl-2-phenylindole with malondialdehyde and 4-hydroxylalkenals. Analytical applications to a colorimetric assay of lipid peroxidation. Chem. Res. Toxicol. 11: 1184-1194. Halliwell, B., Gutteridge, J.M.C. (1999) Free Radicals in Biology and Medicine 3rd ed. New York: Oxford University Press: 140-184. Leonarduzzi, G., Chiarotto, E., Biasi, F., Poli, G. (2005) 4-Hydroxynonenal and cholesterol oxidation products in atherosclerosis. Mol Nutr Food Res; 49: 1044-1049. <p>Supplementary literature:</p> <ol style="list-style-type: none"> Marnett, L.J. (2002) Oxyradicals, lipid peroxidation, and DNA damage. Toxicology 181-182: 219-222. Mateos, R., Lecumberri, E., Ramos, S., Goya, L., Bravo, L. (2005) Determination of malondialdehyde (MDA) by high-performance liquid chromatography in serum and liver as a biomarker for oxidative stress. Application to a rat model for hypercholesterolemia and evaluation of the effect of diets rich in phenolic antioxidants from fruits. Journal of Chromatography B, 		

¹ The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

² The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton

827: 76-82.