

Faculty of Medicine in Rijeka

**Curriculum
2023/2024**

For course

Oxidative Stress and Antioxidants

Study program:	Medical Studies in English (R) (elective) University integrated undergraduate and graduate study
Department:	Department of Medical Chemistry, Biochemistry and Clinical Chemistry
Course coordinator:	prof. dr. sc. Domitrović Robert, univ. mag. med. biochem.
Year of study:	2
ECTS:	1.5
Incentive ECTS:	0 (0.00%)
Foreign language:	Possibility of teaching in a foreign language

Course information:

Free radicals as extremely reactive chemical species represent a potential danger to all cells and contribute to the development of cardiovascular, neurodegenerative and inflammatory diseases, tumors, diabetes and other pathological conditions. However, at the same time, free radicals and other reactive oxygen and nitrogen species (ROS, "reactive oxygen species", RNS, "reactive nitrogen species"), by participating in phagocytosis and oxygenation, have a significant positive effect on metabolism. Within the framework of the course, the modes of action and effects of free radicals and ROS and RNS molecules in oxidative stress and the pathogenesis of various diseases will be discussed. In addition, students will be able to explain how the organism is protected from their harmful effects.

List of assigned reading:

1. Selected scientific papers.

List of optional reading:

1. Internet databases.

Curriculum:

Lectures list (with titles and explanation):

P1 Što je oksidacijski stres?

Objasniti što je oksidacijski stres. Opisati slobodne radikale, reaktivne spojeve kisika i dušika, prooksidanse i antioksidanse. Istaknuti važnost pravilne prehrane. Protumačiti stvaranje reaktivnih spojeva kisika i dušika. Navesti način i mjesta stvaranja slobodnih radikala i drugih reaktivnih spojeva u metabolizmu.

P2 Značaj oksidacijskog stresa

Protumačiti fiziološku funkciju reaktivnih spojeva kisika i dušika. Objasniti ulogu slobodnih radikala i drugih reaktivnih spojeva u metabolizmu.

P3 Biljezi oksidacijskog stresa

Navesti koji su biljezi oksidacijskog oštećenja DNA. Objasniti produkte nastale u reakciji slobodnih radikala s DNA i metode njihovog određivanja. Navesti koji su biljezi oksidacijskog oštećenja proteina. Objasniti produkte nastale u reakciji slobodnih radikala s proteinima i metode njihovog određivanja. Navesti koji su biljezi oksidacijskog oštećenja lipida. Objasniti produkte nastale u reakciji slobodnih radikala s lipidima i metode njihovog određivanja.

P4 Vrste antioksidansa

Navesti enzimske antioksidanse. Objasniti ulogu superoksid dismutaze, glutation peroksidaze i katalaze u redukciji oksidacijskog oštećenja stanice. Navesti neenzimske antioksidanse. Objasniti ulogu vitamina C, vitamina E, karotenoida, glutatona, melatonina, liponske kiseline, flavonoida i dr. spojeva s antioksidacijskim učinkom u sprječavanju oksidacijskog oštećenja stanice.

P5 Oksidacijski stres i bolesti

Povezati reaktivne spojeve kisika i dušika, starenje i patološka stanja. Protumačiti ulogu slobodnih radikala i drugih reaktivnih spojeva u procesu starenja, razvoju dijabetesa, kardiovaskularnih bolesti, tumora i drugih kroničnih bolesti.

Seminars list (with titles and explanation):

S1 Prezentacije seminarskih radova 1

Samostalno izlaganje obrađene seminarske jedinice.

S2 Prezentacije seminarskih radova 2

Samostalno izlaganje obrađene seminarske jedinice.

S3 Prezentacije seminarskih radova 3

Samostalno izlaganje obrađene seminarske jedinice.

S4 Prezentacije seminarskih radova 4

Samostalno izlaganje obrađene seminarske jedinice.

Student obligations:

Attendance and active participation of students in classes. The student must, in agreement with the course leader, prepare a seminar paper and make a PowerPoint presentation from a specific area related to oxidative stress. Students present their PowerPoint presentations in front of the leader and other colleagues. Every student is obliged to submit his seminar paper and PowerPoint presentation in electronic form.

Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

Student evaluation is carried out according to the valid Rulebook on studies of the University of Rijeka and according to the Rulebook on student evaluation at the Faculty of Medicine in Rijeka.

Other notes (related to the course) important for students:

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COURSE HOURS 2023/2024

Oxidative Stress and Antioxidants

Lectures (Place and time or group)	Seminars (Place and time or group)
20.03.2024	
P1 Što je oksidacijski stres?: • ONLINE (09:00 - 10:30) ^[152] ◦ OS-A P2 Značaj oksidacijskog stresa: • ONLINE (09:00 - 10:30) ^[152] ◦ OS-A	
prof. dr. sc. Domitrović Robert, univ. mag. med. biochem. ^[152]	
25.03.2024	
P3 Biljezi oksidacijskog stresa: • ONLINE (13:30 - 15:45) ^[152] ◦ OS-A P4 Vrste antioksidansa: • ONLINE (13:30 - 15:45) ^[152] ◦ OS-A P5 Oksidacijski stres i bolesti: • ONLINE (13:30 - 15:45) ^[152] ◦ OS-A	
prof. dr. sc. Domitrović Robert, univ. mag. med. biochem. ^[152]	
08.04.2024	
	S1 Prezentacije seminarskih radova 1: • Department of Med. chemistry, biochemistry and clin. chemistry (16:00 - 19:45) ^[520] ◦ OS-A
doc.dr. sc. Suman Iva, mag. sanit. ing. ^[520]	
09.04.2024	
	S2 Prezentacije seminarskih radova 2: • Department of Med. chemistry, biochemistry and clin. chemistry (16:00 - 19:45) ^[520] ◦ OS-A
doc.dr. sc. Suman Iva, mag. sanit. ing. ^[520]	
15.04.2024	
	S3 Prezentacije seminarskih radova 3: • Department of Med. chemistry, biochemistry and clin. chemistry (16:00 - 19:45) ^[520] ◦ OS-A
doc.dr. sc. Suman Iva, mag. sanit. ing. ^[520]	
16.04.2024	
	S4 Prezentacije seminarskih radova 4: • Department of Med. chemistry, biochemistry and clin. chemistry (16:00 - 19:45) ^[520] ◦ OS-A
doc.dr. sc. Suman Iva, mag. sanit. ing. ^[520]	

List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
P1 Što je oksidacijski stres?	1	ONLINE
P2 Značaj oksidacijskog stresa	1	ONLINE
P3 Biljezi oksidacijskog stresa	1	ONLINE
P4 Vrste antioksidansa	1	ONLINE
P5 Oksidacijski stres i bolesti	1	ONLINE

SEMINARS (TOPIC)	Number of hours	Location
S1 Prezentacije seminarskih radova 1	5	Department of Med. chemistry, biochemistry and clin. chemistry
S2 Prezentacije seminarskih radova 2	5	Department of Med. chemistry, biochemistry and clin. chemistry
S3 Prezentacije seminarskih radova 3	5	Department of Med. chemistry, biochemistry and clin. chemistry
S4 Prezentacije seminarskih radova 4	5	Department of Med. chemistry, biochemistry and clin. chemistry

EXAM DATES (final exam):

1.	22.04.2024.
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