

Faculty of Medicine in Rijeka

**Curriculum
2024/2025**

For course

**Receptorski mehanizmi u patogenezi upale i septičkog
šoka**

Study program:	Medicina (R) (elective) University integrated undergraduate and graduate study
Department:	Department of Physiology, Immunology and Pathophysiology
Course coordinator:	prof. dr. sc. Muhvić Damir, dr. med.
Year of study:	2
ECTS:	1.5
Incentive ECTS:	0 (0.00%)
Foreign language:	No

Course information:

Kolegij __Receptorski mehanizmi u patogenezi upale i septičkog šoka____ je izborni predmet na _2_ godini Integriranog preddiplomskog i diplomskog sveučilišnog studija Medicina koji se održava u ljetnom __semestru, a sastoji se od _4_ sati predavanja, _17_ sati seminara i _4_ sati vježbi, ukupno 25_ sati (1,5 **ECTS**).

Nastavni plan je slijedeći:

8.5. 2025. 10.00-13.00 P1

15.5. 2025. 10.00-13.00 V1

22.05. 2025 10.00-13.00 S1

29.05.2025. 10.00-13.00 S2

0506.2025. 10.00.13.00 S3

12.06. 2025 10.00-13.00 S4

Cilj kolegija je _shvatiti mehanizme upale i septičkog šoka te upoznati receptore koji to posreduju._____

List of assigned reading:

1. Muhvić D. et al, The involvement of CD14 in the activation of human monocytes by peptidoglycan monomers, Mediators of inflammation, vol 10, 155-162, 2001.
2. Tak P.P. & Firestein G.S.,NF-kB:a key role in inflammatory diseases, J Clin Invest, vol 107, 7-11, 2001.
3. Heumann D. and Glauser M, Pathogenesis of sepsis, Scientific American,Science&Medicine 1994, 28-37.
4. Glauser MP, Pathophysiologic basis of sepsis:Considerations for future strategies of intervention, Critical Care Medicine 2000;28:S4-S8.
5. Weideman B. et al., Soluble peptidoglycan-induced monokine production can be blocked by anti-CD14 monoclonal antibodies and by lipid A partial structures, Infection &Immunity, vol 62, 4709-4715, 1994.
6. Takeda K & Akira S, Toll-like receptors in innate immunity, International Immunology 17(1):1-14, 2005.
- 7.B.Weidemann et al.Specific binding of soluble peptidoglycan and muranyldipeptide to CD14 on human monocytes,Infection &Immunity, Mart 1997.
- 8.Parrillo JE,Pathogenetic mechanisms of septic shock,The new england journal of medicine,vol. 328, No20,1993
- 9.AG Tsitou et al ,Septic shock;current pathogenetic concepts from clinical perspective,Med SciMonit,2005;11(3);RA76-85
- 10.R.Dziarsky,Review:Recognition of bacterial peptidoglycan by the innate immune system,Cell.Mol.Life Sci.60 (2003) 1793-1804

List of optional reading:

1. Patofiziologija udžbenik, Medicinska naklada, Zagreb 2018, osmo izdanje; 16. Poglavlje Upala, str.553-587.

Curriculum:

Lectures list (with titles and explanation):

P1 Upala

Upoznati receptorske mehanizme upale

Seminars list (with titles and explanation):

S1. Uključenost CD14 u aktivaciju humanih monocita peptidoglikanskih monomerima

Uloga CD14 molekule u upali

S2 NF- κ B ; ključna uloga u upalnim bolestima

Uloga NF- κ B u upali

S3 Patogeneza sepse

Patogeneza sepse

S4 Patofiziologija sepse

Patofiziološka osnova sepse. Razmatranje budućih strategija intervencije

S5 Peptidoglikan i njegovi receptori

Proizvodnja monokina izazvana topivim peptidoglikanom može se blokirati anti CD14 monoklonskim protutijelima i parcijalnim strukturama lipida A

S6 Uloga Toll like receptora (TLR) u upali

Toll-like receptori u prirodnom imunitetu

Practicals list (with titles and explanation):

V1. CD14 molekula

Ishodi učenja:

Definirati osnovne pojmove i strukture: Studenti će biti u mogućnosti objasniti osnovne pojmove povezane s bakterijskim staničnim zidovima i prepoznati ključne sastavnice njihove kemijske strukture.

Identificirati ulogu u imunološkom odgovoru: Studenti će moći prepoznati kako određeni molekuli aktiviraju urođeni imunološki odgovor te opisati specifične mehanizme prepoznavanja patogenih molekula od strane imunskog sustava.

Analizirati mehanizme signaliranja: Studenti će biti sposobni analizirati različite signalne puteve aktivirane pri kontaktu s bakterijskim staničnim komponentama i raspraviti njihov utjecaj na razvoj upale.

Procijeniti utjecaj na patogenezu: Studenti će procijeniti utjecaj bakterijskih molekula na razvoj raznih patoloških stanja uključujući upalu i septički šok, te objasniti njihovu ulogu u patogenezi bolesti.

Kritički vrednovati istraživanja: Studenti će razviti sposobnost kritičkog vrednovanja aktualnih znanstvenih istraživanja vezanih uz mehanizme djelovanja bakterijskih molekula u kontekstu patogeneze i moguće terapijske primjene.

Learning Outcomes:

Define basic concepts and structures: Students will be able to explain fundamental concepts related to bacterial

cell walls and identify key components of their chemical structure.

Identify the role in immune response: Students will recognize how specific molecules activate the innate immune response and describe the mechanisms of pathogenic molecule recognition by the immune system.

Analyze signaling mechanisms: Students will be able to analyze different signaling pathways activated upon contact with bacterial cell components and discuss their impact on inflammation development.

Evaluate the impact on pathogenesis: Students will assess the impact of bacterial molecules on the development of various pathological conditions including inflammation and septic shock, and explain their role in disease pathogenesis.

Critically evaluate research: Students will develop the ability to critically evaluate current scientific research related to the mechanisms of bacterial molecule action in the context of pathogenesis and potential therapeutic applications.

Student obligations:

Studenti su dužni pohađati sve oblike nastave!

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

Studenti koji su pohađali 70% nastave mogu izaći na završni ispit.

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

Kolegij se održava od 24.04 do 16.06. 2023.

COURSE HOURS 2024/2025

Receptorski mehanizmi u patogenezi upale i septičkog šoka

Lectures (Place and time or group)	Practicals (Place and time or group)	Seminars (Place and time or group)
05.05.2025		
P1 Upala: <ul style="list-style-type: none">• ONLINE (10:00 - 13:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ		
prof. dr. sc. Muhvić Damir, dr. med. [397]		
15.05.2025		
	V1. CD14 molekula: <ul style="list-style-type: none">• ONLINE (10:00 - 13:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ	
prof. dr. sc. Muhvić Damir, dr. med. [397]		
22.05.2025		
		S1.Uključenost CD14 u aktivaciju humanih monocita peptidoglikanskih monomerima: <ul style="list-style-type: none">• ONLINE (10:00 - 13:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ
prof. dr. sc. Muhvić Damir, dr. med. [397]		
29.05.2025		
		S2 NF-kB ; ključna uloga u upalnim bolestima: <ul style="list-style-type: none">• ONLINE (10:00 - 13:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ
prof. dr. sc. Muhvić Damir, dr. med. [397]		
05.06.2025		
		S3 Patogeneza sepse: <ul style="list-style-type: none">• ONLINE (10:00 - 13:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ S4 Patofiziologija sepse: <ul style="list-style-type: none">• ONLINE (10:00 - 13:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ
prof. dr. sc. Muhvić Damir, dr. med. [397]		
12.06.2025		
		S5 Peptidoglikan i njegovi receptori: <ul style="list-style-type: none">• ONLINE (10:00 - 14:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ S6 Uloga Toll like receptora (TLR) u upali: <ul style="list-style-type: none">• ONLINE (10:00 - 14:00) [397]<ul style="list-style-type: none">◦ RMUPUSŠ
prof. dr. sc. Muhvić Damir, dr. med. [397]		

List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
P1 Upala	4	ONLINE

PRACTICALS (TOPIC)	Number of hours	Location
V1. CD14 molekula	4	ONLINE

SEMINARS (TOPIC)	Number of hours	Location
S1.Uključenost CD14 u aktivaciju humanih monocita peptidoglikanskih monomerima	4	ONLINE
S2 NF-kB ; ključna uloga u upalnim bolestima	4	ONLINE
S3 Patogeneza sepse	2	ONLINE
S4 Patofiziologija sepse	2	ONLINE
S5 Peptidoglikan i njegovi receptori	2	ONLINE
S6 Uloga Toll like receptora (TLR) u upali	3	ONLINE

EXAM DATES (final exam):
