

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

Ime predmeta:	Izbrane vsebine in novosti v biokemiji
Course title:	Selected topics and novelties in biochemistry

Študijski program in stopnja Study programme and cycle	Študijska smer Study option	Letnik Year of study	Semester Semester
Splošna medicina, enovit magistrski študijski program		Prvi	1.
General medicine, Uniform master's degree study program		First	1st

Vrsta predmeta (obvezni ali izbirni) /
Course type (compulsory or elective)

izbirni

elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
5	40	AV LV RV			45	3

Nosilec predmeta / Course coordinator:

prof. dr. Uroš Potočnik

Jeziki /Languages:

Predavanja / Lectures: slovenski/slovene

Vaje / Tutorial: slovenski/slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisites for enrolling in the course or for performing study obligations:

Vsebina (kratek pregled učnega načrta):

Pri predmetu so poglobljeno obravnavane aktualne vsebine s področja medicinske biokemije (na primer biokemijske osnove genske terapije, moderna rekombinantna cepiva ipd.). Obravnavane teme so izbrane ob začetku študijskega leta na osnovi svežih odmevnih znanstvenoraziskovalnih objav in dosežkov s področja biokemije.

Content (syllabus outline):

The course provides in-depth coverage of current topics in the field of medical biochemistry (e.g. biochemical basis of gene therapy, modern recombinant vaccines, etc.). The topics covered are selected at the beginning of the school year on the basis of recent high-profile scientific research publications and achievements in the field of biochemistry.

Temeljni literatura in viri / Reading materials:

• • Znanstvenoraziskovalni in pregledni članki s področja biokemije / Biochemistry research and review articles
• • D.E. Nelson, M.M. Cox, Lehninger Principles of Biochemistry, 8th Ed. New York : Macmillan Learning, 2021.
• • Medical biochemistry. Baynes, John W. ; Dominiczak, Marek H. 6th ed. Elsevier, cop. 2023

Cilji in kompetence:

Študent v obliki skupinskih diskusij in individualnega dela razširjeno in poglobljeno obravnava izbrane teme ozko izbrano temo iz celotnega obsega vsebin izbirnega predmeta. Pri izbirnem predmetu študent utrjuje znanja in veščine, potrebne za samostojno delo in razčlenjevanje posameznih problemov na osnovi podatkov, dobljenih iz sodobne znanstvene in strokovne literature. Hkrati s tem utrjuje znanja in veščine, potrebne za samostojno iskanje sodobnih virov, podatkov iz izbranega področja, njihovo razčlenjevanje, analizo in predstavitev. Cilj je priprava študenta na samostojno obravnavo in predstavitev posameznih tem na osnovi tekočih dogajanj v stroki.

Objectives and competences:

In the form of group discussions and individual work, the student deals in an in-depth way with selected topics from the range of contents of the elective course. In the elective course, the student fortifies the knowledge and skills necessary to work independently and to analyse individual problems on the basis of information obtained from contemporary scientific and professional literature. At the same time, the student develops the knowledge and skills necessary to independently search for contemporary sources and data in the chosen field, analyse, scrutinize and present them. The aim is to prepare the student for independent thinking and presentation of individual topics based on current developments in the field.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent zna razložiti biokemijske procese. Na izbranih primerih interpretira in pojasni molekularne mehanizme delovanja zdravega organizma in okvare, ki privedejo do bolezni ter poda možnosti reševanja in preprečevanja specifičnih biokemijskih stanj.

Študent opiše sodobne biokemijske raziskovalne metode.

Prenesljive/ključne spretnosti in drugi atributi:

Študent pozna in zna opisati delovanje organizma na molekularni ravni. Biokemija je povezana s predmeti Molekularna biologija in Biologija celice. Pomaga pri razumevanju Patofiziologije, Farmakologije in večine kliničnih predmetov.

Intended learning outcomes:

Knowledge and Understanding:

The student can explain biochemical processes. Based on particular cases they interpret and explain molecular mechanisms of functioning of the healthy organism and disorders that consequently lead to the disease with modes of treatment and prevention of specific biochemical states.

The student describes modern biochemical research methods.

Transferable/Key Skills and other attributes:

The student knows and can describe the functioning of an organism at a molecular level. Biochemistry is correlated to the subjects Molecular biology and Cell biology. It helps to understand pathophysiology, pharmacology and most of the clinical subjects.

Metode poučevanja in učenja:

Predavanja, skupinsko in individualno delo, seminarji.

Learning and teaching methods:

Lectures, group and individual work, projects.

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)
ŠTUDIJSKE OBVEZNOSTI ŠTUDENTOV:
- študenti pripravijo seminar na izbrano tematiko in ustno predstavijo seminar s kratkim predavanjem

Delež (v %) /

Share (in %)

40

Assessment methods:

Type (examination, oral, coursework, project):
ACADEMIC OBLIGATIONS OF STUDENTS:
-students should prepare an essay on selected topic and give oral presentation (seminar)

- študenti sodelujejo pri skupinskem delu/delavnicah, pri katerih dobijo oceno za sodelovanje -pisni izpit POGOJI ZA PRISTOP K POSAMEZNEMU PREVERJANJU ZNANJA: Opravljen seminar je pogoj za pristop k pisnemu izpitu.	60	- students participate in group work/workshops where they receive a participation grade -written exam REQUIREMENTS FOR ACCESS TO INDIVIDUAL KNOWLEDGE CHECKING: Students should complete seminar in order to approach to the written exam.
--	------------------	--

Reference nosilca / Course coordinator's references:

- . ČELEŠNIK, Helena Sabina, POTOČNIK, Uroš. Blood-based mRNA tests as emerging diagnostic tools for personalised medicine in breast cancer. *Cancers*. 2023, vol. 15, issue 4, [article no.] 1087, str. [1]-23. ISSN 2072-6694. <https://www.mdpi.com/2072-6694/15/4/1087>, <https://doi.org/10.3390/cancers15041087>, DOI: 10.3390/cancers15041087. [COBISS.SI-ID 141250307], [JCR, SNIP, WoS, Scopus]
financer: ARRS, Programi, P3-0427, SI, Sistemski pristopi k raziskavam človeškega genoma za personalizirano medicino kroničnih imunskih bolezni; ARRS, Projekti, J3-9272, SI, Identifikacija molekularnih biooznačevalcev za napoved kliničnega poteka in zasevanja pri pacientkah s trojno negativnim rakom dojke
kategorija: 1A1 (Z, A', A1/2);
14. AVBELJ, Monika, HAFNER BRATKOVIČ, Iva, LAINŠČEK, Duško, MANČEK KEBER, Mateja, PETERNELJ, Tina Tinkara, PANTER, Gabriela, TREON, Steven P., GOLE, Boris, POTOČNIK, Uroš, JERALA, Roman. Cleavage-mediated regulation of Myd88 signaling by inflammasome-activated caspase-1. *Frontiers in immunology*. Jan. 2022, vol. 12, str. 1-14, ilustr. ISSN 1664-3224. <https://www.frontiersin.org/articles/10.3389/fimmu.2021.790258/full>, <https://doi.org/10.3389/fimmu.2021.790258>, DOI: 10.3389/fimmu.2021.790258. [COBISS.SI-ID 93261315], [JCR, SNIP, WoS do 7. 8. 2022: št. citatov (TC): 2, čistih citatov (CI): 2, čistih citatov na avtorja (CIAu): 0,20, Scopus do 22. 7. 2022: št. citatov (TC): 2, čistih citatov (CI): 2, čistih citatov na avtorja (CIAu): 0,20]
kategorija: 1A1 (Z, A", A', A1/2);
11. REPAS, Jernej, ZUPIN, Mateja, VODLAN, Maja, VERANIČ, Peter, GOLE, Boris, POTOČNIK, Uroš, PAVLIN, Mojca. Dual effect of combined metformin and 2-deoxy-D-glucose treatment on mitochondrial biogenesis and PD-L1 expression in triple-negative breast cancer cells. *Cancers*. 2022, vol. 14, issue 5, str. [1]-30, ilustr. ISSN 2072-6694. <https://doi.org/10.3390/cancers14051343>, <https://www.mdpi.com/2072-6694/14/5/1343>, <https://repozitorij.uni-lj.si/IzpisGradiva.php?id=137225>, DOI: 10.3390/cancers14051343. [COBISS.SI-ID 100035587], [JCR, SNIP, WoS do 14. 4. 2023: št. citatov (TC): 5, čistih citatov (CI): 5, čistih citatov na avtorja (CIAu): 0,71, Scopus do 3. 6. 2023: št. citatov (TC): 6, čistih citatov (CI): 6, čistih citatov na avtorja (CIAu): 0,86]
financer: Raziskava sofinancirana s strani Slovenian Research Agency research core funding No. P1-0055; Raziskava sofinancirana iz MRIC UL IP-0510 BMCM; Raziskava sofinancirana iz FE Infrastructure program; Sofinancer Slovenian Research Agency young researchers program; ARRS, Projekti, J3-6794, SI, Celična energijska presnova kot tarča za zdravljenje raka - genski in farmakološki pristop; ARRS, Projekti, J7-7424, SI, Analiza možnih škodljivih učinkov nanodelcev in spremljajočih mehanizmov - od fizikalno-kemijske ter in vitro karakterizacije do aktivacije prirojenega imunskega sistema; ARRS, Projekti, P3-0067, SI, Farmakologija in farmakogenomika; ARRS, Projekti, P3-0427, SI, Sistemski pristopi k raziskavam človeškega genoma za personalizirano medicino kroničnih imunskih bolezni; Sofinancer Ministry of Education, Science and Sport (C3330-19-952026); ARRS, Programi, P3-0108, SI, Diferenciacija urotelijskih celic
kategorija: 1A1 (Z, A', A1/2)
2. GORIČAN, Larisa, BÜDEFELD, Tomaž, ČELEŠNIK, Helena Sabina, ŠVAGAN, Matija, LANIŠNIK, Boštjan, POTOČNIK, Uroš. Gene expression profiles of methyltransferases and demethylases associated with metastasis, tumor invasion,

CpG73 methylation, and HPV status in head and neck squamous cell carcinoma. *Current issues in molecular biology*. 2023, vol. 45, issue 6, str. 4632-4646, ilustr. ISSN 1467-3045. <https://doi.org/10.3390/cimb45060294>, <https://www.mdpi.com/1467-3045/45/6/294>, DOI: 10.3390/cimb45060294. [COBISS.SI-ID 153940995], [JCR, SNIP] financer: ARRS, Programi, P3-0427, SI, Sistemski pristopi k raziskavam človeškega genoma za personalizirano medicino kroničnih imunskih bolezni; ARRS, Programi, P3-0067, SI, Farmakologija in farmakogenomika; Sofinancer: Univerzitetni klinični center Maribor (interna raziskovalna projekta IRP-2021/02-14 in IRP-2015/01-21) kategorija: 1A3 (Z)

1. MARTIN-ALMEIDA, Mario, PEREZ-GARCIA, Javier, HERRERA-LUIS, Esther, ROSA-BAEZ, Carlos, GORENJAK, Mario, NEERINCX, Anne H., SARDON-PRADO, Olaia, TONCHEVA, Antoaneta, HARNER, Susanne, WOLFF, Christine, BERCE, Vojko, POTOČNIK, Uroš, et al. Epigenome-wide association studies of the fractional exhaled nitric oxide and bronchodilator drug response in moderate-to-severe pediatric asthma. *Biomedicines*. [Online ed.]. 2023, vol. 11, issue 3, str. [1]-15, ilustr. ISSN 2227-9059. <https://www.mdpi.com/2227-9059/11/3/676>, <https://doi.org/10.3390/biomedicines11030676>, DOI: 10.3390/biomedicines11030676. [COBISS.SI-ID 143009027], [JCR, SNIP, WoS, Scopus] financer: Sofinancer: Ministry of Education, Science and Research (BMBF), project no. C330-16-500-106; Sofinancer: Slovenian Research Agency, research core funding no. P3-0427 kategorija: 1A2 (Z, A1/2)