



UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	KLINIČNA BIOKEMIJA IN LABORATORIJSKA MEDICINA
Course title:	Clinical Biochemistry and Laboratory Medicine

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
BIOMEDICINSKA TEHNOLOGIJA BIOMEDICAL TECHNOLOGY		2	3 ali 4

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15	20	-	10	-	105	5

Nosilec predmeta / Lecturer:

Prof. dr. Uroš Potočnik

Jeziki /

Predavanja / Lectures: Slovenščina, Angleščina/Slovene, English

Languages:

Vaje / Tutorial: Slovenščina, Angleščina/Slovene, English

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

Kandidat mora doseči 300 ECTS na predhodnem študiju.

Prerequisites:

Graduate degree 300 ECTS

Vsebina:

1. molekularna in celična klinična biokemija, organizacija in upravljanje kliničnih laboratorijev, informacijski sistemi v laboratorijih, biostatistika in bioinformatika v povezavi s laboratorijsko medicino.

2. Uvajanje novih molekularnih biooznačevalcev v celotno diagnostiko in spremljanje posameznih bolezni npr.: prirojenih motenj presnove, sladkorne bolezni, kostnih bolezni, rakavih obolenj, srčno žilnih obolenj, bolezni prebavil in urogenitalnega trakta.

3. Raziskovalni pristopi za odkrivanje novih bioiznačevalcev in ocena diagnostične uporabnosti laboratorijskih rezultatov in izbor najbolj informativnih biokemičnih kazalcev.

4. Moderne laboratorijske tehnologije za izvajanje standardnih in uvajanje novih biokemijskih preiskav: masna spektroskopija, HPLC, preročna citometrija, skevenatorji naslednje generacije, ...

Content (Syllabus outline):

1. molecular and cellular clinical biochemistry, organisation and management of clinical laboratories, information system in the labs, biostatistics and bioinformatics related to laboratory medicine.

2. Translation of new diagnostic and prognostic molecular biomarkers in clinical practice for different diseases: hereditary metabolic diseases, diabetes mellitus, bone diseases, cancer, cardiovascular dis., gastroenterol. and urogenital dis.

3. Research approaches for new biomarker discovery and assessment of diagnostic accuracy for new biochemical markers and selection of the more useful one.

4. Modern Laboratory technology for conducting of standard clinical biochemical diagnostics and translation of new diagnostic procedures; mass spectrometry. HPLC, flow cytometry, next generation sequencing..

Temeljni literatura in viri / Readings:

1. Laposata, Michael (editor): Laboratory Medicine: The Diagnosis of Disease in the Clinical Laboratory, Second Edition, McGraw-Hill Education, 2014
2. Kaplan LA, Pesce AJ, Kzmierczak SC. Clinical Chemistry: Theory, Analysis, Correlation. 4th ed, Mosby-Aff. Elsevier Science, Missouri, ZDA, 2003
3. Henry JB. Clinical Diagnosis and Management by Laboratory Methods. 20th ed., Saunders Com., Philadelphia, USA, 2001
4. tekoča znanstvena periodika

Cilji in kompetence:

Možnosti odkrivanja, potrjevanja in spremljanja nekaterih bolezni s pomočjo biokemičnih in molekularno genetskih biooznačevalcev, . Pri tem bo in posebej poudarjen interdisciplinarni pristop. Pri uvajanju novih biokemičnih biooznačevalcev podani načini ocenjevanja diagnostične učinkovitosti ter uporabnost le-teh.

Predvideni študijski rezultati:**Znanje in razumevanje:**

Biokemična znanja, uporabna v vsakodnevni klinični praksi, pri diagnosticiranju bolezni ter načrtovanju in spremljanju zdravljenja.

Prenesljive/ključne spretnosti in drugi atributi:

Študent zna iz znanstvene literature povzeti molekularne biooznačevalce najobetavnejše za prenos v klinično prakso.

Metode poučevanja in učenja:

Predavanja, seminarske naloge, laboratorijske vaje

Objectives and competences:

Possibilities of diagnosis and monitoring of selected diseases using biochemical and molecular genetic biomarkers and/or molecular. The special consideration will be given to interdisciplinary approach. The students will recognise the possibilities of evaluation of biochemical markers and other laboratory examinations.

Intended learning outcomes:**Knowledge and understanding:**

Biochemical knowledge and ability to use this knowledge most appropriately at clinical practice . diagnosis, planning and monitoring of therapy.

Transferable/Key Skills and other attributes:

Student is able to extract from scientific literature molecular biomarkers most promising for translation into clinical practise.

Learning and teaching methods:

Lectures, seminars, laboratory work

Načini ocenjevanja:

Delež (v %) /

Weight (in %)

Assessment:

pisni izpit,

60%

written examination,

seminarska naloga (pisna in predstavitev)

40%

seminars (written and presented)

Reference nosilca / Lecturer's references:

1. JOSTINS, Luke, MITROVIČ, Mitja, POTOČNIK, Uroš, et al. Host-microbe interactions have shaped the genetic architecture of inflammatory bowel disease. *Nature*, ISSN 0028-0836. [Print ed.], 2012, vol. 491, no. 7422, str. 119-124, doi: [10.1038/nature11582](https://doi.org/10.1038/nature11582). [COBISS.SI-ID [512230968](https://cobiss.si/512230968)],
2. REPNIK, Katja, KODER, Silvo, SKOK, Pavel, Ferkolj, Ivan, POTOČNIK, Uroš. Transferrin level before treatment and genetic polymorphism in HFE gene as predictive markers for response to adalimumab in Crohn's disease patients. *Biochemical genetics*, ISSN 1573-4927, 2016, vol. 54, issue 4, str. 476-486, ilustr. <http://link.springer.com/article/10.1007/s10528-016-9734-0>, doi: [10.1007/s10528-016-9734-0](https://doi.org/10.1007/s10528-016-9734-0). [COBISS.SI-ID [5689919](https://cobiss.si/5689919)],
- DEŽELAK, Matjaž, REPNIK, Katja, KODER, Silvo, Ferkolj, Ivan, POTOČNIK, Uroš. A prospective pharmacogenomic study of Crohn's disease patients during routine therapy with anti-TNF- α drug adalimumab: contribution of ATG5, NFKB1, and CRP genes to pharmacodynamic variability. *Omic*s, ISSN 1557-8100, 2016, vol. 20, no. 5, 296-309 str. <http://online.liebertpub.com/doi/10.1089/omi.2016.0005>, doi: [10.1089/omi.2016.0005](https://doi.org/10.1089/omi.2016.0005). [COBISS.SI-ID [512594744](https://cobiss.si/512594744)],
3. HORVAT, Matej, POTOČNIK, Uroš, REPNIK, Katja, KAVALAR, Rajko, ZADNIK, Vesna, POTRČ, Stojan, ŠTABUC, Borut. Single nucleotide polymorphisms in genes MACC1, RAD18, MMP7 and SDF-1[α] as prognostic factors in resectable colorectal cancer. *Radiology and oncology*, ISSN 1581-3207. [Online ed.]. <https://www.degruyter.com/downloadpdf/j/raon.ahead-of-print/raon-2016-0043/raon-2016-0043.xml>, doi: [10.1515/raon-2016-0043](https://doi.org/10.1515/raon-2016-0043). [COBISS.SI-ID [512631096](https://cobiss.si/512631096)],
4. KODER, Silvo, REPNIK, Katja, Ferkolj, Ivan, PERNAT DROBEŽ, Cvetka, SKOK, Pavel, WEERSMA, Rinse K., POTOČNIK, Uroš. Genetic polymorphism in ATG16L1 gene influences the response to adalimumab in Crohn's disease patients. *Pharmacogenomics*, ISSN 1462-2416, 2015, vol. 16, no. 3, str. 191-204, doi: [10.2217/pgs.14.172](https://doi.org/10.2217/pgs.14.172). [COBISS.SI-ID [512474168](https://cobiss.si/512474168)],
5. CLEYNEN, Isabelle, BOUCHER, Gabrielle, JOSTINS, Luke, SCHUMM, Philip L., ZEISSIG, Sebastian, AHMAD, Tariq, ANDERSEN, Vibeke, ANDREWS, Jane M, ANNESE, Vito, BRAND, Stephan, et al., MITROVIČ, Mitja (sodelavec pri raziskavi), POTOČNIK, Uroš (sodelavec pri raziskavi), et al. Inherited determinants of Crohn's disease and ulcerative colitis phenotypes : a genetic association study. *The Lancet*, ISSN 1474-547X. [Online ed.], 2016, vol. 387, iss. 10014, str. 156-167. [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(15\)00465-1/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00465-1/abstract), doi: [10.1016/S0140-6736\(15\)00465-1](https://doi.org/10.1016/S0140-6736(15)00465-1). [COBISS.SI-ID [512567352](https://cobiss.si/512567352)],