

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Farmacevtska biotehnologija
Course title:	Pharmaceutical Biotechnology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
BIOMEDICINSKA TEHNOLOGIJA/ BIOMEDICAL TECHNOLOGY 3. stopnja/3rd Degree		1	1/2

Vrsta predmeta / Course type

Temeljni/Basic

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
20	40	-	15	-	195	9

Nosilec predmeta / Lecturer:

doc. dr. Uroš Maver

Sonosilci predmeta / Lecturer

prof. dr. Uroš Potočnik

Jeziki /

Predavanja / Lectures:

Slovenski, angleški/Slovene, English

Languages:

Vaje / Tutorial:

Slovenski, angleški/Slovene, English

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

Prerequisites:

Kandidat mora imeti pred vpisom ustrezno znanje iz naravoslovnih ved z ustreznega področja na nivoju univerzitetnega študija.

Prior to entering, the candidate for postgraduate program must have an appropriate knowledge and understanding of bioscience (biology, chemistry, physics, mathematics) on the university level.

Vsebina:

Content (Syllabus outline):

- LADME sistem (predklinična obravnava zdravilnih učinkovin)
- Biomedicinsko inženirstvo
- Osnove biomedicinske analitike
- In vitro testiranje varnosti in učinkovitosti zdravilnih učinkovin in medicinskih pripomočkov
- Tehnologija rekombinantne DNA
- Najpomembnejši rekombinantni biofarmaceutiki
- Priprava in uporaba monoklonskih protiteles
- Gensko zdravljenje rakavih in ostalih obolenj
- Sistemi vnosa genov v organizem

- LADME system (preclinical drug evaluation)
- Biomedical Engineering
- Basic biomedical analytics
- In vitro testing of the safety and efficacy of drugs and medical devices
- Recombinant DNA technology
- The most important recombinant biopharmaceuticals
- Preparation and use of monoclonal antibodies
- Gene therapy of cancer and other diseases
- Introduction to gene delivery into the body

Temeljni literatura in viri / Readings:

- Sandy B. Primrose, By (author) Richard Twyman : Principles of Gene Manipulation and Genomics; 8th Revised edition; Wiley-Blackwell (an imprint of John Wiley & Sons Ltd), 2016
- Crommelin J.A., Sindelar R.D.: Pharmaceutical Biotechnology, Third edition. CRC Press, New York, 2007
- Hunt S.P., Livesey, F.J. : Functional Genomics. A practical approach, Oxford University Press, 2000.
- Licinio J, Wong MA-Li: Pharmacogenomics. Wiley-VCH, Germany, 2002.
- Goodman L.S., Gilman A.G., The pharmacological basis of therapeutics, 12th edition, McGraw-Hill, New York, 2011.
- Alberts B., Johnson A., Lewis J., Raff M., Roberts K., Walter P., Molecular Biology of the Cell, 5th edition, Garland Science, 2007.
- Periodične publikacije: Advanced Healthcare Materials, Tissue Engineering - Part B: Reviews

Cilji in kompetence:

- Pridobiti znanja molekularne biologije, molekularne genetike in predvsem razumevanje novih načinov terapij in tarč, ki izhajajo iz spoznavanja človeškega genoma.
- Spoznavanje najpomembnejših kompleksnih zdravilnih učinkovin iz področja biofarmacevtikov.
- Razširiti znanje s področja priprave novih zdravil in medicinskih pripomočkov, vključno s testiranjem njihove varnosti in učinkovitosti.

Objectives and competences:

- Acquire knowledge of molecular biology, molecular genetics and understanding of novel approaches to gene therapy derived from human genome sequencing.
- Getting to know the most important active substances in the field of biopharmaceuticals.
- Expand knowledge on the preparation of new drugs and medical devices, including testing their safety and efficacy.

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

- Z razumevanjem sestave in delovanja biofarmacevtikov in uporabe genske terapije se poveča praktično znanje o biofarmacevtikih, glavnih terapevtskih učinkih in razumevanje nastajanja neželenih učinkov.
- S spoznavanjem novih pristopov k razvoju zdravil, medicinskih pripomočkov in njihovega testiranja, se povečajo možnosti za inovativno razmišljanje študentov v smeri razvoj novih terapevtskih pristopov.

Prenesljive/ključne spretnosti in drugi atributi:

- Iskanje podatkov po svetovnih bazah podatkov, aplikacija v prakso (iskanje primerov)

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

- By understanding the composition and functioning of biopharmaceuticals and the use of gene therapy to increase the practical knowledge of biopharmaceuticals main therapeutic effects and understanding the emergence of side effects.
- By learning new approaches of the development of medicines, medical devices and their testing to increase opportunities for innovative thinking in students towards the development of new therapeutic approaches.

Transferable/Key Skills and other attributes:

- Knowledge of database searching, application into practical work (case studies)

Metode poučevanja in učenja:

Predavanja, seminarske naloge, samostojno delo

Learning and teaching methods:

Lectures, tutorials, individual work, conversations.

Načini ocenjevanja:

pisni izpit,
seminarska naloga (pisna in predstavitev)

Delež (v %) /

Weight (in %)

Assessment:

written examination,
seminars (written and presented)

Reference nosilca / Lecturer's references:

FINŠGAR, Matjaž, PERVA-UZUNALIČ, Amra, STERGAR, Janja, GRADIŠNIK, Lidija, **MAVER, Uroš**. Novel chitosan/diclofenac coatings on medical grade stainless steel for hip replacement applications. Scientific reports, ISSN 2045-2322, Published online:24 May 2016, vol. 6, art. no. 26653, str. 1-17.

STERGAR, Janja, **MAVER, Uroš**. Review of aerogel-based materials in biomedical applications. Journal of sol-gel science and technology, ISSN 1573-4846, 2016, vol. 77, iss. 3, str. 738-752.

NARANĐA, Jakob, GRADIŠNIK Lidija, GORENJAK Mario, VOGRIN Matjaž, **MAVER Uroš**, Isolation and characterization of human articular chondrocytes from surgical waste after total knee arthroplasty (TKA), PeerJ, 2017.

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.

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. Omics, ISSN 1557-8100, 2016, vol. 20, no. 5, 296-309 str.

ZDOVC, Jurij, PETRE, Maja, PIŠLAR, Mitja, REPNIK, Katja, MRHAR, Aleš, VOGRIN, Matjaž, **POTOČNIK, Uroš**, GRABNAR, Iztok. Downregulation of ABCB1 gene in patients with total hip or knee arthroplasty influences pharmacokinetics of rivaroxaban : a population pharmacokinetic-pharmacodynamic study. European Journal of Clinical Pharmacology, ISSN 0031-6970, 2019, vol. , iss. , str. <https://link.springer.com/article/10.1007/s00228-019-02639-8>, doi: 10.1007/s00228-019-02639-8. [COBISS.SI-ID 4671089]