Univerza v Mariboru
Medicinska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS			
Ime predmeta:	**Farmacevtska biotehnologija**		
Course title:	**Pharmaceutical Biotechnology**		
Študijski program in stopnja Study programme and cycle	**Študijska smer Study option**	**Letnik Year of study**	**Semester Semester**
Biomedicinska tehnologija/3. stopnja		**1**	**1 ali 2**
Biomedical Technology/3rd Degree			

Vrsta predmeta (obvezni ali izbirni) / Course type (compulsory or elective)	Temeljni Basic
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**
		15						
20	**40**	**AV**	**LV**	**RV**			**195**	**9**

Nosilec predmeta / Course coordinator:	Izr. prof. dr. Uroš Maver 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):	**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 biofarmacevtiki 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 / Reading materials:

- 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:	**Objectives and competences:**
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.	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:	**Intended learning outcomes:**
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.	**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.
Prenosljive/ključne spretnosti in drugi atributi: Iskanje podatkov po svetovnih bazah podatkov, aplikacija v prakso (iskanje primerov)	**Transferable/key competences and other abilities:** Knowledge of database searching, application into practical work (case studies)
Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja Seminarske naloge Vaje	Lectures Seminars Tutorial

Načini ocenjevanja:	**Delež (v %) / Share (in %)**	**Assessment methods:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Method (written or oral exam, coursework, project):
Pisni izpit	60 %	Written examination
Seminarska naloga (pisna in predstavitev)	40 %	Seminars (written and presented)

Reference nosilca / Course coordinator's references:

Izr. prof. dr. Uroš MAVER:

FINŠGAR, Matjaž, PERVA-UZUNALIĆ, 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, doi: 10.1038/srep26653. [COBISS.SI-ID 19591446], [JCR, SNIP, WoS do 13. 10. 2019: št. citatov (TC): 23, čistih citatov (CI): 10, čistih citatov na avtorja (CIAu): 2.00, Scopus do 29. 8. 2019: št. citatov (TC): 23, čistih citatov (CI): 9, čistih citatov na avtorja (CIAu): 1.80] kategorija: 1A1 (Z, A', A1/2); uvrstitev: SCI, Scopus, MBP; tip dela je verificiral OSICT točke: 29.69, št. avtorjev: 5

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. https://link.springer.com/content/pdf/10.1007%2Fs10971-016-3968-5.pdf, doi: 10.1007/s10971-016-3968-5. [COBISS.SI-ID 512585528], [JCR, SNIP, WoS do 15. 12. 2019: št. citatov (TC): 53, čistih citatov (CI): 52, čistih citatov na avtorja (CIAu): 26.00, Scopus do 29. 11. 2019: št. citatov (TC): 57, čistih citatov (CI): 56, čistih citatov na avtorja (CIAu): 28.00] kategorija: 1A1 (Z, A', A1/2); uvrstitev: SCI, Scopus, MBP; tip dela je verificiral OSICN točke: 54.11, št. avtorjev: 2

MILOJEVIĆ, Marko, GRADIŠNIK, Lidija, STERGAR, Janja, SKELIN, Maša, STOŽER, Andraž, VESENJAK, Matej, DOBNIK-DUBROVSKI, Polona, MAVER, Tina, MOHAN, Tamilselvan, STANA-KLEINSCHEK, Karin, MAVER, Uroš. Development of multifunctional 3D printed bioscaffolds from polysaccharides and NiCu nanoparticles and their application. Applied Surface Science, ISSN 1873-5584. [Online ed.], 2019, vol. 488, str. 836-852. https://www.sciencedirect.com/science/article/pii/S0169433219315910, doi: /10.1016/j.apsusc.2019.05.283. [COBISS.SI-ID 512899896], [JCR, SNIP, WoS do 13. 7. 2019: št. citatov (TC): 0, čistih citatov (CI): 0, čistih citatov na avtorja (CIAu): 0, Scopus do 25. 6. 2019: št. citatov (TC): 0, čistih citatov (CI): 0, čistih citatov na avtorja (CIAu): 0] kategorija: 1A1 (Z, A'', A', A1/2); uvrstitev: SCI, Scopus, MBP; tip dela je verificiral OSICN točke: 16.33, št. avtorjev: 11

Prof. dr. Uroš POTOČNIK:

GORENJAK, Mario, ZUPIN, Mateja, JEZERNIK, Gregor, SKOK, Pavel, POTOČNIK, Uroš. Omics data integration identifies ELOVL7 and MMD gene regions as novel loci for adalimumab response in patients with Crohn's disease. Scientific reports, ISSN 2045-2322, [v tisku][12 str.]. https://www.nature.com/articles/s41598-021-84909-z, https://doi.org/10.1038/s41598-021-84909-z, doi: 10.1038/s41598-021-84909-z. [COBISS.SI-ID 54882051], [JCR, SNIP, WoS do 26. 3. 2021: št. citatov (TC): 0, čistih citatov (CI): 0, čistih citatov na avtorja (CIAu): 0, Scopus do 21. 3. 2021: št. citatov (TC): 0, čistih citatov (CI): 0, čistih citatov na avtorja (CIAu): 0] kategorija: 1A1 (Z, A', A1/2)

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-a drug adalimumab: contribution of ATG5, NFKB1, and CRP genes to pharmacodynamic variability. Omics, 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. [COBISS.SI-ID 512594744], [JCR, SNIP, WoS do 11. 8. 2019: št. citatov (TC): 9, čistih citatov (CI): 8, čistih citatov na avtorja (CIAu): 1.60, Scopus do 29. 11. 2019: št. citatov (TC): 9, čistih citatov (CI): 9, čistih citatov na avtorja (CIAu): 1.80] kategorija: 1A2 (Z, A1/2); uvrstitev: SCI, Scopus, MBP; tip dela je verificiral OSICM točke: 17.56, št. avtorjev: 5

GOLE, Boris, POTOČNIK, Uroš. Pre-treatment biomarkers of anti-tumour necrosis factor therapy response in Crohn's disease : a systematic review and gene ontology analysis. Cells, ISSN 2073-4409, June 2019, vol. 8, iss. 6, str. 1-21. https://www.mdpi.com/2073-4409/8/6/515, doi: 10.3390/cells8060515. [COBISS.SI-ID 512899384], [JCR, WoS do 10. 8. 2020: št. citatov (TC): 1, čistih citatov (CI): 1, čistih citatov na avtorja (CIAu): 0.50] kategorija: 1A2 (Z, A1/2); uvrstitev: SCI, MBP; tip dela je verificiral OSICM točke: 43.77, št. avtorjev: 2