



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet: Subject Title:	Osnove molekularne biologije Basics of molecular biology
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Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Izobraževalna kemija Educational Chemistry		2.	poletni Spring

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. Vaje Lab. Work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15	15			150		6

Nosilec predmeta / Lecturer:

Jeziki / Predavanja / Lecture:
Languages: Vaje / Tutorial:

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

Vsebina:

- DNA struktura in lastnosti, replikacija (prokarionti, eukarionti), rekombinacija DNA, DNA popravljalni mehanizmi, DNA mutacije, struktura kromosomov
- RNA struktura in lastnosti, vrste RNA molekul in funkcije, transkripcija (prokarionti, eukarionti), postranskripcijske modifikacije
- Struktura proteinov, sinteza proteinov, posttranslacijske modifikacije proteinov, zvižanje proteinov, transport proteinov
- Regulacija proteinske sinteze: regulacija ekspresije genov pri prokariontih, pri bakteriofagih, pri evkariotskih organizmih (enoceličnih, multicelularnih, povezava z embrionalnim razvojem), regulacija na ravni translacije in posttranslacijska regulacija,
- Molekularni vidiki embrionalnega razvoja
- Celična delitev (mejoza, mitoza),
- Celični cikel, proliferacija, diferenciacija celic, apoptoza
- Povezovanje celic v tkiva, komunikacija med celicami, signalne poti, receptorji, hormoni
- Virusi, HIV, SARS, DNA diagnostika pri infektivnih boleznih
- Osnove molekularne genetike, genetske bolezni

Contents (Syllabus outline):

- DNA structure and characteristics, replication (prokaryotes, eukaryotes), recombination, repair and mutations, structure and function of genes and chromosomes,
- RNA structure characteristics: role of different types of RNA, transcription (prokaryotes, eukaryotes), post transcription modification
- Protein structures, synthesis of proteins, translation, posttranslational modifications, protein folding, protein trafficking
- Regulation of protein synthesis: transcriptional regulation of gene expression, regulation of translation, posttranslational regulation
- Embryonic development-molecular view
- Cell division (meiosis, mitosis)
- Cell cycle: proliferation, differentiation, apoptosis
- Integration of cells into tissues, communication between cells, signal transduction, receptors, hormone signaling
- Immune system
- Viruses :HIV, SARS, Avian influence, DNA diagnostics and infection diseases
- Basic molecular genetics, genetic diseases

Temeljni študijski viri / Textbooks:

1. B. ALBERTS et al.: *Molecular biology of the cell., 4th Ed.*, Garland Publish, Inc., New York, 2002
2. LODISH H., Baltimore D., Berk A., Zipursky S.L., Matsudaira P., Darnell J.: *Molecular Cell Biology*, 5th Ed., Scientific American Books, Freeman and Co., New York, 2004

Cilji:

- Predmet bo nudil študentom osnovno razumevanje in celostni pristop k osnovnim molekularnim procesom v celici, tkivih, organih in celotnem organizmu. Poudarek bo na prenosu DNA informacije za sintezo proteinov.

Objectives:

- Students will understand basic molecular mechanisms in the cell, how cells are organized in tissues, organs and whole organisms. The focus will be on transfer of genomic information to synthesis of proteins.

Predvideni študijski rezultati:

Znanje in razumevanje:

osnovne molekularne procese v celici

Prenesljive/ključne spretnosti in drugi atributi:

-

Intended learning outcomes:

Knowledge and Understanding:

- basic molecular processes in the cell

Transferable/Key Skills and other attributes:

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje
- Individualno delo

Learning and teaching methods:

- Lectures
- Laboratory excersises
- Individual work

Načini ocenjevanja:Delež (v %) /
Weight (in %)**Assessment:**

- Pisni
- ustni izpit

60%
40%

- Written
- oral exam

Materialni pogoji za izvedbo predmeta :

- Laboratorij, računalniška učilnica

Material conditions for subject realization

- Laboratory, computer room

Obveznosti študentov:*(pisni, ustni izpit, naloge, projekti)*

- Pisni in ustni izpit

Students' commitments:*(written, oral examination, coursework, projects):*

- Written and oral exam