



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz citologije in histologije
Course title:	Selected Topics in Cytology and Histology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študij Ekološke znanosti, 3. stopnja		1. ali 2.; 1st or 2nd	1. 2. ali 3. ; 1st, 2nd or 3rd
Doctoral Study Ecological Sciences, 3rd degree			

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
5	5				140	5

Nosilec predmeta / Lecturer:

Jeziki / Languages:	Predavanja / Lectures:	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

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

Poznavanje citologije in histologije na ravni univerzitetnega programa

Prerequisites:

Knowledge of cytology and histology at graduate level

Vsebina:

Obravnavana so izbrana poglavja iz naslednjih sklopov.
Pri predmetu se študenti seznanijo z izbranimi raziskovalnimi metodami citologije in histologije ter s kemijsko sestavo celic. Študenti spoznajo značilnosti rastlinske in živalske celice, celicne strukture in njihove funkcije ter različne vrste tkiv.
-Organizacija evkariotske in prokariotske celice; celice kot eksperimentalni modeli
-Molekularna sestava celic
-Metode proučevanja celic
-Celicne membrane in transport snovi skozi njih
-Mitochondriji in mehanizem oksidativne fosforilacije

Content (Syllabus outline):

Selected topics in the following chapters are discussed.
This subject provides an introduction to the selected methods for studying cells and the chemical structure of cells. It focuses on main characteristics of plant and animal cells, cell structures, their function and different types of tissue.
-Organisation of eukaryotic and prokaryotic cell; cells as experimental models
-The molecular composition of cells
-Tools of cell biology
-Cell membranes and membrane transport
-Mitochondria and the mechanism of oxidative phosphorylation

-Endoplazemski retikulum in Golgijev aparat
 -Lizosomi in peroksisomi
 -Citoskelet in gibanje celice (aktinski filamenti, intermediatni filamenti in mikrotubuli)
 -Jedro, kromatin in kromosomi
 -Celicni ciklus, mitozna in mejoza
 -Medcelicne povezave
 -Vrste tkiv in njihove funkcije

-Endoplasmic reticulum and Golgi apparatus
 -Lysosomes and peroxisomes
 -The cytoskeleton and cell movement (actin filaments, intermediate filaments and microtubules)
 -The nucleus, chromatin and chromosomes
 Cell cycle, mitosis and meiosis
 -Cell to cell interaction
 -Types of tissue and their function

Temeljni literatura in viri / Readings:

- Alberts B. s sod. (2011) Molecular biology of the cell, 5th Ed. Garland Science, New York.
- Alberts B. s sod. (2009) Essential cell biology. Garland Science, New York.
- Karp G. (2005) Cell and Molecular Biology. Concepts and Experiments. John Wiley & Sons, Inc., New York.
- Lodish H. s sod. (2010) Molecular Cell Biology. W.H. Freeman, New York.
- Jezernik K., Veranič P., Sterle M. (2012) Celična biologija. Učbenik za študente Medicinske fakultete. DZS, Ljubljana.

Cilji in kompetence:

Študenti obvladajo izbrane metode v moderni citologiji in histologiji.
 Usvojijo vrhunska znanja na specifičnih področjih v citologiji in histologiji.

Objectives and competences:

Students get skills in selected methods used in modern cytology and histology.
 Students acquire top-level knowledge in specific fields in cytology and histology.

Predvideni študijski rezultati:

Znanje in razumevanje:
 Poglobljeno razumejo znanja s področja biologije celice, ki so nujno potrebna na drugih področjih biologije.
 Podrobno spoznajo izbrana področja, kjer uporabljamo znanja biologije celice (ekologija, kmetijstvo, biotehnologija, medicina itd.).
Prenesljive/ključne spretnosti in drugi atributi:
 Študenti izpopolnijo izkušnje in laboratorijske spretnosti, ki so nujno potrebne pri samostojnem laboratorijskem delu.
 Razumejo najzahtevnejše znanstvene prispevke.

Intended learning outcomes:

Knowledge and understanding:
 Students advanced understand knowledge concerning cytology and histology, which are essential for other field of biology.
 They get acquainted advanced knowledge with the areas in which cell biology is applied (ecology, agriculture, biotechnology, medicine and others).
Transferable/Key Skills and other attributes:
 Students acquire advanced experience and laboratory skills which are essential for an autonomous laboratory work.
 They understand most advanced scientific contributions.

Metode poučevanja in učenja:

Predavanja,
 Seminarska naloga.

Learning and teaching methods:

Lectures,
 Seminar essay.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Seminarska naloga , Pisni izpit	30%, 70%	Seminar (30%), Written exam (70%)

Reference nosilca / Lecturer's references:

LIPOVŠEK DELAKORDA, Saška, JANŽEKovič, Franc, NOVAK, Tone. Autophagic activity in the midgut gland of the overwintering harvestmen *Gyas annulatus* (Phalangidae, Opiliones). *Arthropod structure & development*, ISSN 1467-8039, 2014, str. 1-8, ilustr., doi: [10.1016/j.asd.2014.06.001](https://doi.org/10.1016/j.asd.2014.06.001). [COBISS.SI-ID [20696584](https://www.cobiss.si/id/20696584)]

NOVAK, Tone, JANŽEKovič, Franc, LIPOVŠEK DELAKORDA, Saška. Contribution of non-troglobiotic terrestrial invertebrates to carbon input in hypogean habitats = Prispevek prezimujočih netroglobiontskih kopenskih nevretenčarjev k vnosu ogljika v podzemeljske habitate. *Acta carsologica*, ISSN 0583-6050, 2013, letn. 42, št. 2/3, str. 301-309, tabele. <http://ojs.zrc-sazu.si/carsologica/article/view/669/600>, doi: [10.3986/ac.v42i2-3.669](https://doi.org/10.3986/ac.v42i2-3.669). [COBISS.SI-ID [20238600](https://www.cobiss.si/id/20238600)]

LIPOVŠEK DELAKORDA, Saška, LEITINGER, Gerd, RUPNIK, Maja. Ultrastructure of *Clostridium difficile* colonies. *Anaerobe*, ISSN 1075-9964, 2013, vol. 24, str. 66-70, ilustr., doi: [10.1016/j.anaerobe.2013.09.014](https://doi.org/10.1016/j.anaerobe.2013.09.014). [COBISS.SI-ID [20178184](https://www.cobiss.si/id/20178184)]

LIPOVŠEK DELAKORDA, Saška, JANŽEKovič, Franc, LEITINGER, Gerd, RUPNIK, Marjan. Rab3a ablation related changes in morphology of secretory vesicles in major endocrine pancreatic cells, pituitary melanotroph cells and adrenal gland chromaffin cells in mice. *General and comparative endocrinology*, ISSN 0016-6480, 2013, vol. 185, str. 67-79. <http://dx.doi.org/10.1016/j.ygcen.2013.01.007>. [COBISS.SI-ID [19733768](https://www.cobiss.si/id/19733768)]

LIPOVŠEK DELAKORDA, Saška, LETOFSKY-PAPST, Ilse, HOFER, Ferdinand, LEITINGER, Gerd, DEVETAK, Dušan. The evidence on the degradation processes in the midgut epithelial cells of the larval antlion *Euroleon nostras* (Geoffroy in Fourcroy, 1785) (Myrmeleontidae, Neuroptera). *Micron*, ISSN 0968-4328. [Print ed.], 2012, vol. 43, iss. 5, str. 651-665, ilustr., doi: [10.1016/j.micron.2011.11.012](https://doi.org/10.1016/j.micron.2011.11.012). [COBISS.SI-ID [18855176](https://www.cobiss.si/id/18855176)]