



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

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| Predmet: | Mikrobiote – kompleksne združbe mikroorganizmov |
| Course title: | Microbiota – complex microbial communities |

| 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.- 4.; 1st-4th |
| Doctoral Study Ecological Sciences, 3rd degree | | | |

Vrsta predmeta / Course type: Izbirni/Elective

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 |
|------------------------|--------------------|------------------|------------------------------|-----------------------------|-------------------------------|------|
| 10 | - | - | 20 | - | 150 | 6 |

Nosilec predmeta / Lecturer: Prof. dr. Maja Rupnik

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

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

Osnovno znanje s področja mikrobiologije in molekularne biologije

Prerequisites:

Basic knowledge in microbiology and molecular biology

Vsebina:

Predmet vključuje mikrobne združbe, ki naseljujejo različne predele različnih gostiteljev, njihov pomen ter metode, ki se uporabljajo pri njihovem preučevanju

- različni tipi mikrobiot
- mikrobiota prebavil pri človeku in živalih
- bakterijske, glivne in virusne mikrobiote
- uporaba '-omik' (genomika, metabolomika) in analize kompleksnih

Content (Syllabus outline):

Course will cover different microbiot types from different hosts, their role in host biology and methodological approaches for their analysis:

- intestinal microbiota in humans and animals
- microbiota in other regions
- bacterial, fungal and viral microbiota
- '-omic' approaches (genomics, metabolomics) and analysis of

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| <p>podatkov za proučevanje mikrobnih združb</p> <ul style="list-style-type: none"> - interakcije med mikroorganizmi - interakcije mikroorganizem – gostitelj - interakcije mikrobiot v živem in neživem okolju - vplivi okolja na sestavo in delovanje mikrobiot |
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| <p>complex data sets in studies of microbial communities</p> <ul style="list-style-type: none"> - microbe-microbe interactions - microbe-host interactions - interactions among different microbiomes - environmental influences on microbiota structure and function |
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Temeljni literatura in viri / Readings:

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| <p>Izbrani pregledni članki s področja</p> |
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Cilji in kompetence:

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| <p>Poznati vlogo posameznih mikrobnih skupin za funkcionalnost mikrobiot</p> <p>Poznati vlogo mikrobiot ter predvsem črevesne mikrobiote za gostitelja</p> <p>Poznati možne vplive okolja na delovanje mikrobiot</p> <p>Poznati nabor sodobnih metod, ki se uporabljajo za analizo kompleksnih mikrobnih združb, ki tvorijo mikrobiote</p> |
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Objectives and competences:

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| <p>To understand the role of different microbial groups for functional microbiota</p> <p>To understand the role of microbiota (gut and other regions) for the host</p> <p>To understand environmental influences on different types of microbiota</p> <p>To be familiar with methods used in microbiota research</p> |
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Predvideni študijski rezultati:

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| <p>Znanje in razumevanje:</p> <ul style="list-style-type: none"> - pomen mikrobiot za gostitelja - okoljski in drugi vplivi na sestavo in delovanje mikrobiot - mikrobiologija kompleksnih združb - poznavanje nabora metod <p>Prenesljive/ključne spretnosti in drugi atributi:</p> <ul style="list-style-type: none"> - poznavanje sodobnih metod, ki se lahko uporabijo tudi v drugih raziskavah - obvladovanje področja z obsežno literaturo (izbor ustrezne literature) |
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Intended learning outcomes:

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| <p>Knowledge and understanding:</p> <ul style="list-style-type: none"> - role of different types of microbiota in host biology - environmental and other factors influencing microbiota - microbiology of complex communities - understanding of different methods <p>Transferable/Key Skills and other attributes:</p> <ul style="list-style-type: none"> - methodological knowledge - managing and selecting appropriate literature |
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Metode poučevanja in učenja:

Learning and teaching methods:

- Predavanja
- Demonstracijski prikazi praktičnih primerov
- Vaje

- Lectures
- Demonstration of practical examples
- Practical work

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

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| Seminarska naloga ali poročilo iz vaj | 30 | Short written report or seminar |
| Ustni izpit | 50 | Oral exam |

Reference nosilca / Lecturer's references:

1. Skraban J, Dzeroski S, Zenko B, Mongus D, Gangl S, **Rupnik M.** Gut microbiota patterns associated with colonization of different *Clostridium difficile* ribotypes. PLoS One. 2013;8(2):e58005. doi: 10.1371/journal.pone.0058005.
2. Skraban J, Dzeroski S, Zenko B, Tusar L, **Rupnik M.** Changes of poultry faecal microbiota associated with *Clostridium difficile* colonisation. Vet Microbiol. 2013 Aug 30;165: 416-24.
3. Žalig, S., **Rupnik, M.** *Clostridium difficile* infection and gut microbiota. *Seminars in colon & rectal surgery*, 2014, vol. 25(3):124-127.
4. Janezic S, **Rupnik M.** Genomic diversity of *Clostridium difficile* strains. Res Microbiol. 2015 May;166(4):353-60.
5. **Rupnik M.** Toward a true bacteriotherapy for *Clostridium difficile* infection. N Engl J Med. 2015 Apr 16;372(16):1566-8
6. Janezic S, Potocnik M, Zidaric V, **Rupnik M.** Highly Divergent *Clostridium difficile* Strains Isolated from the Environment. PLoS One. 2016 Nov 23;11(11):e0167101
7. Trček J, Mahnič A, **Rupnik M.** Diversity of the microbiota involved in wine and organic apple cider submerged vinegar production as revealed by DHPLC analysis and next-generation sequencing. Int J Food Microbiol. 2016; 223: 57-62.