Faculty of Medicine in Rijeka

Curriculum
2025/2026

For course

Mechanism of Action of Probiotic Bacteria

Study program:	**Medical Studies in English (R)** (elective) University integrated undergraduate and graduate study
Department:	**Department of Microbiology and Parasitology**
Course coordinator:	**prof. dr. sc. Gobin Ivana, dipl. sanit. ing.**
Year of study:	**4**
ECTS:	**1.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

Probiotic microorganism are live microorganisms which when administered in adequate amounts confer a health benefit on the host. In our intestines there are a number of bacteria that are important for the maturation of immune status and normal development and function of the intestine. Probiotic concept involves oral administration of live beneficial microorganisms (probiotics), while prebiotic concept introduces selective sources of carbohydrate useful for probiotic bacteria in the digestive system. Synbiotic concept is the combined use of probiotic and prebiotic concept to achieve increased beneficial effect on health. If we want to use microorganism for in probiotic purposes, it must meet strict probiotic election strategy, and the three main aspects of the strategy are: general, technological and functional. The aim of the course is to teach students the mechanisms of probiotic prebiotics and to familiarize themselves with the strategy of selecting probiotic microorganisms and applying it in clinical practice.

List of assigned reading:

- Guarino A. et all.Probiotic Bacteria and Their Effect on Human Health and Well-Being. Karger. 2013.
- Pandey KR, Naik SR, Vakil BV. Probiotics, prebiotics and synbiotics- a review. Journal of Food Science and Technology. 2015;52(12):7577-7587. doi:10.1007/s13197-015-1921-1.
- Kechagia M, Basoulis D, Konstantopoulou S, et al. Health Benefits of Probiotics: A Review. ISRN Nutrition. 2013;2013:481651. doi:10.5402/2013/481651.

List of optional reading:

Prepared copies of the most recent scientific articles of each of the teaching units will be available to students. Websites are an important source of information related to individual teaching topic.

Curriculum:

Lectures list (with titles and explanation):

P1 The mechanisms of action of probiotic bacteria

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P2 Health effect of probiotic and prebiotics.

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P3. Lactica acid bacteria as probiotics.

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P4. The microbiota of the GI system.

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P5. The role of bacteriophages in the homeostasis of intestinal microbiota.

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Seminars list (with titles and explanation):

S1 Obesity and microbiota.

-

S2. The therapeutic potential of fecal microbiota transplantation.

-

S3. Probiotics in Celiac Disease

-

S4. Probiotics in post-bariatric surgery

-

S5. Does Consumption of Fermented Foods Modify the Human Gut Microbiota?

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S6. Probiotics and the Microbiota-Gut-Brain Axis: Focus on Psychiatry

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S7. The role of the skin microbiota in acne pathophysiology

-

S8. Probiotics to prevent infantile colic

-

S9. A review of a potential and promising probiotic candidate - Akkermansia muciniphila

-

S10. Psychobiotics: A new approach for treating mental illness?

-

S11. Microbiome in athletes: can probiotics help?

-

S12. Can we stop aging: Probiotics as an elixir of life?

-

S13. Can probiotic bacteria affect the appetite?

-

S14. Probiotic bacteria and vaginitis

-

S15. Vaginal microbiota

-

P16. Vaginal seeding after C-section

-

S17. Vaginosis and yogurt application

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Student obligations:

Students are expected to attend classes regularly, participate actively and to ask questions. Students are advised to prepare for each teaching units, reading and reviewing prepared teaching materials.

During the course each student/group of students will give a presentation of the results, in the form of 15-20 minute oral presentation, followed by 10-15 minutes of discussion. Successfully completed presentation of results, and active participation in the discussions will be part of the final grade in addition to the written exam.

Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

The study program will be monitored and evaluated according to the prescribed regulations of the School of Medicine, University of Rijeka and the Ministry of Science, Education and Sports. Students will evaluate their teachers and their classes in anonymous survey.

Other notes (related to the course) important for students:

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COURSE HOURS 2025/2026

Mechanism of Action of Probiotic Bacteria

Lectures (Place and time or group)	**Seminars** (Place and time or group)
24.03.2026	

P1 The mechanisms of action of probiotic bacteria:
• ONLINE (14:30 - 17:00) [250]
  ○ MAPB
 	
P2 Health effect of probiotic and prebiotics.:
• ONLINE (14:30 - 17:00) [250]
  ○ MAPB
 	
P3. Lactica acid bacteria as probiotics.:
• ONLINE (14:30 - 17:00) [250]
  ○ MAPB	

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26.03.2026	

	S2. The therapeutic potential of fecal microbiota transplantation.:
	• ONLINE (10:00 - 12:00) [246]
	  ○ MAPB
	
	S15. Vaginal microbiota:
	• ONLINE (11:45 - 13:15) [515]
	  ○ MAPB
	
	S14. Probiotic bacteria and vaginitis:
	• ONLINE (16:00 - 18:15) [250]
	  ○ MAPB
	
	P16. Vaginal seeding after C-section:
	• ONLINE (16:00 - 18:15) [250]
	  ○ MAPB

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31.03.2026	

P4. The microbiota of the GI system.:
• ONLINE (14:30 - 16:00) [250]
  ○ MAPB
 	
P5. The role of bacteriophages in the homeostasis of intestinal microbiota.:
• ONLINE (14:30 - 16:00) [250]
  ○ MAPB
	S1 Obesity and microbiota.:
	• ONLINE (16:00 - 18:00) [250]
	  ○ MAPB
	
	S3. Probiotics in Celiac Disease:
	• ONLINE (16:00 - 18:00) [250]
	  ○ MAPB

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03.04.2026	

	S6. Probiotics and the Microbiota-Gut-Brain Axis: Focus on Psychiatry:
	• ONLINE (09:00 - 12:00) [250]
	  ◦ MAPB
	
	S10. Psychobiotics: A new approach for treating mental illness?:
	• ONLINE (09:00 - 12:00) [250]
	  ◦ MAPB
	
	S12. Can we stop aging: Probiotics as an elixir of life?:
	• ONLINE (09:00 - 12:00) [250]
	  ◦ MAPB

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07.04.2026	

	S7. The role of the skin microbiota in acne pathophysiology:
	• ONLINE (14:30 - 16:00) [250]
	  ◦ MAPB
	
	S8. Probiotics to prevent infantile colic:
	• ONLINE (14:30 - 16:00) [250]
	  ◦ MAPB
	
	S9. A review of a potential and promising probiotic candidate - Akkermansia muciniphila:
	• ONLINE (14:30 - 16:00) [250]
	  ◦ MAPB

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09.04.2026	

	S11. Microbiome in athletes: can probiotics help?:
	• ONLINE (14:00 - 16:30) [250]
	  ◦ MAPB
	
	S13. Can probiotic bacteria affect the appetite?:
	• ONLINE (14:00 - 16:30) [250]
	  ◦ MAPB
	
	S17. Vaginosis and yogurt application:
	• ONLINE (14:00 - 16:30) [250]
	  ◦ MAPB

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List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
P1 The mechanisms of action of probiotic bacteria	1	ONLINE
P2 Health effect of probiotic and prebiotics.	1	ONLINE
P3. Lactica acid bacteria as probiotics.	1	ONLINE
P4. The microbiota of the GI system.	1	ONLINE
P5. The role of bacteriophages in the homeostasis of intestinal microbiota.	1	ONLINE

SEMINARS (TOPIC)	Number of hours	Location
S1 Obesity and microbiota.	2	ONLINE
S2. The therapeutic potential of fecal microbiota transplantation.	2	ONLINE

S3. Probiotics in Celiac Disease	1	ONLINE
S4. Probiotics in post-bariatric surgery	1	
S5. Does Consumption of Fermented Foods Modify the Human Gut Microbiota?	1	
S6. Probiotics and the Microbiota-Gut-Brain Axis: Focus on Psychiatry	1	ONLINE
S7. The role of the skin microbiota in acne pathophysiology	1	ONLINE
S8. Probiotics to prevent infantile colic	1	ONLINE
S9. A review of a potential and promising probiotic candidate - Akkermansia muciniphila	1	ONLINE
S10. Psychobiotics: A new approach for treating mental illness?	1	ONLINE
S11. Microbiome in athletes: can probiotics help?	1	ONLINE
S12. Can we stop aging: Probiotics as an elixir of life?	1	ONLINE
S13. Can probiotic bacteria affect the appetite?	1	ONLINE
S14. Probiotic bacteria and vaginitis	1	ONLINE
S15. Vaginal microbiota	2	ONLINE
P16. Vaginal seeding after C-section	1	ONLINE
S17. Vaginosis and yogurt application	1	ONLINE

EXAM DATES (final exam):
