Faculty of Medicine in Rijeka

Curriculum
2025/2026

For course

Nutrition, Metabolism, Aging, and Aging-related Diseases

Study program:	**Medical Studies in English (R)** (elective) University integrated undergraduate and graduate study
Department:	**Department of Molecular Medicine and Biotechnology**
Course coordinator:	**prof. dr. sc. Volarević Siniša, dr. med.**
Year of study:	**4**
ECTS:	**1.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

The course aims to introduce the students to the current understanding of the link between metabolism, cancer, and accelerated aging at the molecular level. Particular emphasis will be put on the role of unhealthy habits regarding eating and nutrition on cancer pathogenesis and accelerated aging. Students will also be informed about the implications of this knowledge for the prevention and treatment of aging-related diseases, particularly cancer and neurodegenerative disorders.

List of assigned reading:

Lodish H, Berk A, Zipursky SL, Matsudaira P, Baltimore D, Darnell JE. (1999) Molecular Cell Biology. 4th edition, W H Freeman & Co.

List of optional reading:

Deleyto-Seldas N and Efeyan A. The mTOR-autophagy axis and the control of metabolism. Front Cell Dev Biol, 9:655731 (2021)

Vander Heiden MG et al. Understanding the Warburg effect: the metabolic requirements of cell proliferation. Science, 324:1029-1033 (2009)

de Cabo, and Mattson MP. Effects of Intermittent fasting on health, aging, and disease. N Engl J Med. 381:2541-2551 (2019)

Longo VD and Anderson RM. Nutrition, longevity, and disease: from molecular mechanisms to interventions. Cell. 185:1455-1470 (2022)

Curriculum:

Lectures list (with titles and explanation):

Metabolic reprogramming in cancer

Metabolic reprogramming in cancer.

Seminars list (with titles and explanation):

Dysregulation of energy metabolism in cancer

Dysregulation of energy metabolism in cancer.

The key role of the insulin receptor-PI3K-mTORC1 signaling pathway in cancer and aging

The key role of the insulin receptor-PI3K-mTORC1 signaling pathway in cancer and aging

Dysregulated protein synthesis drives cancer pathogenesis and accelerates aging

Dysregulated protein synthesis drives cancer pathogenesis and accelerates aging

Unhealthy habits regarding eating and nutrition, metabolism, aging, and cancer

Unhealthy habits regarding eating and nutrition, metabolism, aging, and cancer

Healthy habits regarding eating and nutrition in cancer prevention and treatment

Healthy habits regarding eating and nutrition in cancer prevention and treatment.

Healthy habits regarding eating and nutrition in slowing down the aging process

Healthy habits regarding eating and nutrition in slowing down the aging process

Student obligations:

Classs attendance 70%.

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

Classs attendance 70%.

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

1. Metabolic reprogramming in cancer
2. Dysregulation of energy metabolism in cancer
3. The key role of the insulin receptor-PI3K-mTORC1 signaling pathway in cancer and aging
4. Dysregulated protein synthesis drives cancer pathogenesis and accelerates aging
5. Unhealthy habits regarding eating and nutrition, metabolism, aging, and cancer
6. Healthy habits regarding eating and nutrition in cancer prevention and treatment
7. Healthy habits regarding eating and nutrition in slowing down the aging process

COURSE HOURS 2025/2026

Nutrition, Metabolism, Aging, and Aging-related Diseases

Lectures (Place and time or group)	**Seminars** (Place and time or group)
18.05.2026	
Metabolic reprogramming in cancer: • P09 - TEACHING IN ENGLISH (15:00 - 18:45) [154] ○ NMAAAD	
prof. dr. sc. Volarević Siniša, dr. med. [154]	
19.05.2026	

	Healthy habits regarding eating and nutrition in cancer prevention and treatment:
	• P01 (13:00 - 19:00) [154]
	  ○ NMAAAD
	
	Healthy habits regarding eating and nutrition in slowing down the aging process:
	• P01 (13:00 - 19:00) [154]
	  ○ NMAAAD

prof. dr. sc. Volarević Siniša, dr. med. [154]	
20.05.2026	

	Dysregulated protein synthesis drives cancer pathogenesis and accelerates aging:
	• P06 (13:00 - 17:30) [154]
	  ○ NMAAAD
	
	Unhealthy habits regarding eating and nutrition, metabolism, aging, and cancer:
	• P06 (13:00 - 17:30) [154]
	  ○ NMAAAD

prof. dr. sc. Volarević Siniša, dr. med. [154]	
26.05.2026	

	Dysregulation of energy metabolism in cancer:
	• P07 (13:00 - 17:30) [154]
	  ○ NMAAAD
	
	The key role of the insulin receptor-PI3K-mTORC1 signaling pathway in cancer and aging:
	• P07 (13:00 - 17:30) [154]
	  ○ NMAAAD

prof. dr. sc. Volarević Siniša, dr. med. [154]	

List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
Metabolic reprogramming in cancer	5	P09 - TEACHING IN ENGLISH

SEMINARS (TOPIC)	Number of hours	Location
Dysregulation of energy metabolism in cancer	4	P07

The key role of the insulin receptor-PI3K-mTORC1 signaling pathway in cancer and aging	2	P07
Dysregulated protein synthesis drives cancer pathogenesis and accelerates aging	3	P06
Unhealthy habits regarding eating and nutrition, metabolism, aging, and cancer	3	P06
Healthy habits regarding eating and nutrition in cancer prevention and treatment	4	P01
Healthy habits regarding eating and nutrition in slowing down the aging process	4	P01

EXAM DATES (final exam):
