

Genome Stability and Cancer

Subject area: Biology/Biomedical Engineering

University:

TalTech

Level:

MA all years, PhD

Teaching mode:

hybrid: some students participate online, other students attend real-life

Instructor(s):

Tatiana Moiseeva

Short description

This course aims to give the student a detailed understanding of the mechanisms responsible for maintaining genome stability and how their deregulation is related to cancer. The course assumes prior basic knowledge of molecular and cell biology. The course will focus of the causes and consequences of DNA damage, DNA damage signaling, DNA repair pathways, and links between genome stability and cancer.

Full description

The course consists of eight lectures, five classes with student presentations (two per class), and the final exam. The lectures will cover the main mechanisms ensuring genome stability in human cells and their relation to cancer. Each student has to prepare a 15-20 min presentation on a topic related to DNA damage response and cancer. Lectures will cover the following topics:

- 1) Main types of DNA damage and how to detect it. Genome stability and cancer.
- 2) Ionizing radiation-induced DNA damage
- 3) Basic mechanisms of DNA replication and replication-associated repair
- 4) Causes and consequences of replication stress
- 5) Signaling pathways in DNA damage response
- 6) Excision repair pathways
- 7) Double strand break repair pathways
- 8) The role of telomere maintenance in cancer

<http://ois2.ttu.ee/uusois/subject/LKG0250>

Learning outcomes

At the end of the course, the student will be able to:

- describe the main sources and types of DNA damage, and the connections between genome stability and cancer;
- name the main DNA repair pathways and enzymes involved in DNA repair;

- independently read, evaluate, and summarize scientific articles related to genome stability and cancer;
- outline the main approaches targeting genome instability for cancer treatment.

Recommended in particular for students of the following study programmes

General information

Contact hours per week: 4 (2 classes, 90 min each)

Total workload: 78 (in student hours for the whole course)

ECTS credits: 3

Language: English

Course start date: 30 January 2023

Course end date: 09 June 2023

Add. info about start date: The exact day of the week and time is not decided yet. At the moment the first day of the semester is given.

Weekly teaching day/time:

Time zone: CET +1 (Estonia, Israel)

Further information: Every student will be required to do a presentation online.

Prerequisites: The students should have understanding of molecular and cell biology at the Master's level.

Activities and methods: Lectures, Seminars, Self-study

Presence on campus: not required

Final examination

Form: written

Date:

Location/format: online

Re-sit possibility: yes

Transcript available: end of semester

Add. info/requirements:

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places:	5
Minimum participants:	3 (including the TalTech students on site)
Internal course code:	LKG0250
Contact:	tatiana.moiseeva@taltech.ee

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