



## DEPARTMENT OF MICROBIOLOGY, TUMOR AND CELL BIOLOGY

### **C1F5636, Microbiota and Cancer, 1.5 credits (hec)**

Mikrobiota och cancer, 1,5 högskolepoäng

*Third-cycle level / Forskarnivå*

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#### **Approval**

This syllabus is approved by the The Committee for Doctoral Education on 2024-01-30, and is valid from autumn semester 2024.

#### ***Responsible department***

Department of Microbiology, Tumor and Cell Biology, Faculty of Medicine

#### **Prerequisite courses, or equivalent**

Basic knowledge on cancer and cell biology is needed.

#### **Purpose & Intended learning outcomes**

##### **Purpose**

This course intends to impart knowledge and introduce analytical tools to critically assess current ideas and evidence underpinning the role of the microbiota in cancer development and their effects on therapeutic regimes. A final goal is that the students shall be able to critically assess the research published on this subject and formulate the necessary criteria to test their assumptions. This can be in the form of a defined research project.

##### **Intended learning outcomes**

At the end of the course the student is expected to:

- understand various ways to study the microbiota in health and disease
- be able to assess what tools are available to study the function of the microbiota in cancer
- increased understanding on cancer pathology, especially gastrointestinal malignancies
- be able to explore the molecular mechanisms underlying the impact of the microbiota on cancer development
- understand how the microbiota may be a determinant in influencing treatment strategies

## Course content

Cancer susceptibility is sometimes defined as a consequence of gene-environment interaction. A critical component of our immediate environment is the commensal microbiota, which have a major impact on metabolism and immunity, two facets of physiology that can contribute to cancer development/increase the risk for cancer. This course aims to convey current ideas and an understanding of the tools necessary to assess the slew of reports that link the microbiota to cancer development and treatment. The modules/lectures will explore how high throughput studies have been applied to assess this link, paying particular attention to discussing the strengths of the evidence and the limitations of the analyses.

## Forms of teaching and learning

The course will be organized as a series of lectures coupled with defined discussion topics, led by selected lectures.

All students are expected to participate in the discussions with invited experts/lecturers. Apart from lectures, students will be involved in journal club discussion and writing project proposals. Critical thinking will be gained by discussion during lectures, and peer learning on the topics and proposals. Students are also very much encouraged and expected to engage in critical dialectic constructive discussions throughout the course.

### *Language of instruction*

The course is given in English

## Grading scale

Pass (G) /Fail (U)

## Compulsory components & forms of assessment

### Compulsory components

Attendance of the lectures, scheduled discussions and seminars is compulsory. In special cases, with limited absence, the student can compensate with a written report upon discussion with the course organisers.

### Forms of assessment

To pass the course the students must show that they have reached the learning outcomes of the course. This will be assessed formatively during the group discussions with the lecturers, and by an assessment based on writing and presenting a microbiota-cancer project related to their own research interests.

## Course literature

The students will be provided with relevant research papers prior and during the course.  
Recommended book: by Martin Blaser

Recommended review papers:

1. Targeting the gut and tumor microbiota in cancer Park EM, Chelvanambi M, Bhutiani N, Kroemer G, Zitvogel L, Wargo JA. Nat Med. 2022 Apr;28(4):690-703. doi: 10.1038/s41591-022-01779-2. Epub 2022 Apr 19. PMID: 35440726
2. The Cancer Microbiome: Recent Highlights and Knowledge Gaps  
Knippel RJ, Drewes JL, Sears CL. Cancer Discov. 2021 Oct;11(10):2378-2395. doi: 10.1158/2159-8290.CD-21-0324. Epub 2021 Aug 16. PMID: 34400408
3. Microbiome and cancer  
Cullin N, Azevedo Antunes C, Straussman R, Stein-Thoeringer CK, Elinav E. Cancer Cell. 2021 Oct 11;39(10):1317-1341. doi: 10.1016/j.ccell.2021.08.006. Epub 2021 Sep 9. PMID: 34506740