

## SB00027, Single-cell tumor biology and tumor heterogeneity, 1.5 credits

### *Third cycle*

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#### **1. Confirmation**

The syllabus was confirmed by the Council for Postgraduate Education on 2018-02-20 to be valid from autumn semester 2018.

Responsible institute: Biomedicine

#### **2. Position in the educational system**

The course is an elective course within the third cycle at Sahlgrenska Academy.

#### **3. Entrance qualifications**

The course is open for PhD students accepted by a Swedish or international university.

To benefit from the course you should have a background in genetics, cell biology, biomedicine, biochemistry or similar.

#### **4. Course content**

This course gives knowledge about single-cell biology and how individual cells can be analyzed to understand biological processes, especially within tumor biology. The course will include lectures with theory, practical exercises and data analysis. The following topics will be included: single cell biology, analytical methods to analyze DNA, RNA and protein at single-cell level, tools to analyze single-cell data, implementation of single-cell data to understand biological and tumor-related questions.

#### **5. Learning outcomes**

After completing the course the student is expected to be able to:

##### *Knowledge and understanding*

- Explain the difference in analyzing individual cells and cell populations.
- Describe the potentials and the limitations of different analytical tools to study individual cells.
- Discuss the use of single-cell analysis in tumor biology

##### *Skills and abilities*

- Perform single-cell analysis
- Interpret single-cell data
- Propose an experimental setup to study a biological question at single cell level.
- Justify the use of single cell and/or cell population analysis in different experimental systems.
- Apply their background knowledge in single cell biology to a new topic in biology or medicine.

### *Judgement and approach*

- Assess the eligibility of applied single-cell analysis to address biological questions in reported studies.

### **6. Required reading**

Lecture material and scientific articles will be provided throughout the course.

### **7. Assessment**

All course parts are compulsory (lectures, practical exercises and data analysis). Final grade will be based on a written report after the course.

A student who has failed a test twice has the right to change examiners, if it is possible. A written application should be sent to the institute.

### **8. Grading scale**

The grades are Pass or Fail.

### **9. Course evaluation**

Course evaluation is carried out in writing with the aid of the Sahlgrenska Academy's joint course evaluation, and orally via a dialogue with the students. The teacher responsible for the course compiles an analysis of the course evaluations and makes suggestions for the development of the course. Analyses and suggestions are conveyed to the students and published on the University of Gothenburg's learning platform, GUL.

### **10. Additional information**

This course will be given in English.

Students are expected to read the university's policy for prevention of plagiarism (<http://www.ub.gu.se/skriva/plagiering>). Suspected cases of plagiarism will be reported to the university disciplinary committee.

Computer access and internet is required since all communication concerning the course and relevant documents, such as lectures, exercise and literature, will be posted at GUL.