

**SC00033 Proteomics sample preparation and applications, 1.5 credits**  
Proteomik, provpreparation och applikationer, 1.5 högskolepoäng

*Third Cycle/Forskarnivå*

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**Confirmation**

This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 28-08-2018, and is valid from the spring semester 2019.

Responsible institute: Core facilities

**Entry requirements**

Admitted to PhD studies.

**Course content**

The aim of the course is the basic topics of proteomics, applications and the methods used in proteomics. The course will cover separation of proteins and peptides, sample preparation techniques, including immunoprecipitation, basic theory of biological mass spectrometry (MS) and liquid-chromatography-MS instruments, data analysis and bioinformatics of MS data. Teaching will be performed through lectures, instrument demos and practical use of the mass spectrometry results.

**Learning outcomes**

On successful completion of the course, the PhD student is expected to be able to:

*Knowledge and understanding*

- become familiar with and to give examples of separation methods and enrichment techniques that can be used in sample preparation
- describe and discuss the design of proteomic study in terms of a simple or a more complex sample
- explain the difficulties and suggest methods for quantification of protein expression

*Skills and ability*

- the use of results from data base matching for protein identification
- planning of the procedure from protein extraction in a cell lysate to the analysis of the difference in protein expression

*Judgement and approach*

- judge and criticise the sensitivity and variation in quantitative proteomic analysis
- compare results from different acquisition methods of mass spectrometry.

**Types of instruction**

The course consists of lectures, instrument demos and and workshop for the use of the results from mass spectrometry analysis.

**Requested readings**

Separate list of literature and links to websites at <http://proteomics.cf.gu.se/proteomics/courses/current-course>

**Assessment**

At least 75% attendance at instrument demo and use of results, written exam with 70% correct answers. Absence or failure from these tasks can be compensated by a written report. The written examination/assessment will be web-based and using multiple choice as well as free text questions.

A doctoral 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.

**Grading scale**

The grades are Pass or Fail.

**Course evaluation**

There will be a written web-based course evaluation at GUL after the course. The teacher, responsible for the course, will make a summary of the evaluation. This will point out directions for the next course and will also be reported to the students as well as published on GUL.

**Additional information**

This course includes more applications and focus on sample preparation prior to mass spectrometry analysis. No practical experiments and less MS theory.