

Metabolomics (C002718)

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0

Study time 80 h

Course offerings and teaching methods in academic year 2024-2025

A (semester 1)

Dutch

Gent

seminar
lecture

Lecturers in academic year 2024-2025

Morreel, Kris

WE09

lecturer-in-charge

Offered in the following programmes in 2024-2025

crdts

offering

[Master of Science in Teaching in Science and Technology\(main subject Biochemistry and Biotechnology\)](#)

3

A

[Master of Science in Biochemistry and Biotechnology](#)

3

A

Teaching languages

Dutch

Keywords

Metabolite profiling, separation techniques, mass spectrometry, computational metabolomics, metabolic networks, flux analysis

Position of the course

Metabolomics is an optional course in the second year Masters in Biochemistry and Biotechnology, and combines methods belonging to the field of analytical chemistry and statistics for a general analysis of metabolite concentrations. This course introduces the separation and data analysis methods that are currently applied to reveal changes in the metabolome (the full suite of metabolites present in a living tissue). This will enable the student to judge the pros and cons of metabolome techniques.

Contents

Extraction and derivatization methods

Metabolite profiling using liquid chromatography (LC), gas chromatography (GC), and capillary electrophoresis (CE) hyphenated to mass spectrometry (MS), and using nuclear magnetic resonance (NMR)

Metabolic fingerprinting via direct infusion-MS and via NMR

Data analysis using principal component analysis (PCA) and partial least squares (PLS)

High-throughput structural characterization methods

Metabolic networks versus correlation networks

Connection between metabolic flux and metabolite abundance-based correlations

Flux analysis

Initial competences

The student should be acquainted with the principles of biochemistry, statistics, analytical and organic chemistry.

Final competences

1 The student knows the pros and cons of different metabolomics procedures

2 The student is able to interpret metabolome results in relation to metabolic flux

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture

Study material

Type: Slides

Name: Systems biology of the metabolism

Indicative price: Free or paid by faculty

Optional: no

References

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Course content-related study coaching

Questions will be answered on demand

Assessment moments

end-of-term assessment

Examination methods in case of periodic assessment during the first examination period

Oral assessment, Assignment

Examination methods in case of periodic assessment during the second examination period

Oral assessment, Assignment

Examination methods in case of permanent assessment**Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible

Calculation of the examination mark

100% periodic evaluation