GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2024-2025

Glycobiology (C002713)

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)	English	Gent	seminar
			lecture

Lecturers in academic year 2024-2025

Callewaert, Nico	WE10	lecturer-in-charge
Meuris, Leander	WE10	co-lecturer

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Master of Science in Biochemistry and Biotechnology	3	A
Exchange programme in Biochemistry and Biotechnology (master's level)	3	A

Teaching languages

English

Keywords

Sugars,carbohydrates,glycoconjugates,analytical methodology,heterologous expressionsystems,host-pathogen interaction,cellular adhesion

Position of the course

The goal of the course is to introduce the advanced life sciences student to the important roles of glycoconjugates in diverse contemporary research fields. The course has the following specific objectives:
1) Acquiring a solid basic knowledge on glycosylation (structures and biosynthetic pathways).
2) Introduction to the methodology which is used to study glycoconjugates and their functions.
3) Introduction to the role of glycans in host-pathogen interactions, in inflammation and in cancer.
4) Introduction to 'glycobiotechnology' (applied aspects of the course content).

Contents

1. General concepts of protein and lipid glycosylation; polysaccharides.

2. Synthesis of glycoconjugates in prokaryotic and eukaryotic cells.
3. Techniques for the study of glycan structure (chromatography, electrophoresis, mass spectrometry, NMR).
4. Sugar binding proteins: the decoders of information in glycan structure.
5. Functions of glycoconjugates (focus: host-pathogeninteractions, inflammation and cancer).
6. Applications (glycobiotechnology): the glycosylation-properties of the different biotechnologically relevant protein-production host cell types, use of disease-related glycosylation changes for diagnosis, glycoconjugate vaccines.

Initial competences

Bachelor-level biochemistry
Bachelor-level molecular biology
Bachelor-level analytical biochemistry
Bachelor-level gene technology

Final competences

1 Explain the function of glycoconjugates in cellular recognition.
2 Acquire knowledge of glycoconjugate biosynthetic pathways.
3 Acquire knowledge of glycoconjugate-analysis in fundamental research and production of biopharmacueticals.
4 Acquire knowledge of the structure, synthesis and breakdown of biological carbohydrate polymers.
5 Acquire knowledge of glycoconjugate production methods for fundamental research and as drugs.

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: Ppt slides
Indicative price: € 5
Optional: no
Language : English
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No

References

Journal club is organised as part of the course; during one of the workshops, each student reads and presents an important glycobiology research paper published in the year preceding the course year.

Course content-related study coaching

Online questions to the teacher via Ufora.
Extra help with course contents before after each lesson and during lesson breaks, during classroom problem solving sessions and during lab sessions.

Assessment moments

end-of-term and continuous assessment

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

Written assessment with open-ended questions

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

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Non-semester schedule linked: journal club contribution, in which the student critically analyzes a recent researchpaper and presents the contents to the teachers and fellow students in a short presentation.

Calculation of the examination mark

Not-semester schedule linked: once by contributing to the course's 'journal club' (15% of course's points) + end-of-semester examination (85%).
The scores are added and if a global no-pass score is obtained, re-examination is only done through a written examination.