

Protein Chemistry (I002615)

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

Credits 4.0 **Study time 120 h**

Course offerings and teaching methods in academic year 2024-2025

| | | | | |
|----------------|---------|------|------------|------|
| A (semester 1) | English | Gent | group work | 0.0h |
| | | | lecture | |
| | | | practical | |
| | | | seminar | 0.0h |

Lecturers in academic year 2024-2025

| | | |
|-------------------|------|--------------------|
| Van Damme, Els | LA25 | lecturer-in-charge |
| Vanhaeren, Hannes | LA25 | co-lecturer |

Offered in the following programmes in 2024-2025

| | crdts | offering |
|--|-------|----------|
| Master of Science in Bioinformatics(main subject Bioscience Engineering) | 4 | A |
| Master of Science in Bioscience Engineering: Cell and Gene Biotechnology | 4 | A |
| Exchange Programme in Bioinformatics (master's level) | 4 | A |
| Exchange Programme in Bioscience Engineering: Cell and Gene Biotechnology (master's level) | 4 | A |

Teaching languages

English

Keywords

Proteins, enzymes, structure, protein-protein/ligand interactions, function of proteins, modifications, analysis methods

Position of the course

- To acquire knowledge related to structure and properties of proteins, and their most important functions
- To understand different analytical techniques used in protein chemistry
- To critically assess scientific literature related to protein research

Contents

1. Structure of proteins: amino acids, structural motifs (alpha helix/beta-sheet), protein folding and prediction of protein structure
2. Post-translational modifications of proteins, in vivo (e.g. glycosylation, phosphorylation, ubiquitinylation) and in vitro (chemical modification of proteins eg. radioactive/fluorescent labels) – importance of modification for protein function
3. Structure-function relationships: Structural analysis of proteins - DNA recognition in prokaryotes and eukaryotes, enzymatic activity, membrane proteins, signal transduction, recognition of other proteins
4. Techniques in protein research: sequence analysis of proteins, chromatographic techniques for separation of amino acids, peptides and proteins (gel filtration, ion exchange chromatography, affinity chromatography), electrophoretic techniques, mass spectrometry
5. Study of the interactions between proteins and ligands (calorimetry – biosensors - arrays - Y2H – Tandem affinity chromatography – immunoprecipitation and pull down assays)

Initial competences

Basic knowledge of biochemistry and molecular biology.

Final competences

1

2
3
4
5
6
7
8
9

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

Group work, Seminar, Lecture, Practical

Extra information on the teaching methods

Practicals and exercises are obligatory

Study material

Type: Syllabus

Name: Protein chemistry

Indicative price: € 8

Optional: no

Language : English

Number of Pages : 150

Oldest Usable Edition : 2024

Available on Ufora : No

Online Available : No

Available in the Library : Yes

Available through Student Association : Yes

References

Scientific papers and books dealing with proteins, protein function and protein analysis techniques.

Course content-related study coaching

Additional information or explanation can be obtained by personal contact, by email or during exercises.

Assessment moments

end-of-term and continuous assessment

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

Oral assessment, Written assessment with open-ended questions

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

Oral assessment, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Participation, Peer and/or self assessment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

Written examination followed by oral discussion

Calculation of the examination mark

Lectures: 75% Practical and exercises: 25%

Practicals and exercises are obligatory. Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.

Illegal absence will lead to a score of maximum 9/20, regardless of the score for the theoretical exam. If the student scores less than 10/20 on either the theory or the practicals and exercises, this student cannot pass and will receive the lowest non-pass score.

