

Molecular Toolbox (C003817)

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

Credits 4.0

Study time 110 h

Course offerings and teaching methods in academic year 2024-2025

A (semester 1)

English

Gent

seminar

lecture

practical

Lecturers in academic year 2024-2025

Gheysen, Godelieve

LA25

lecturer-in-charge

Offered in the following programmes in 2024-2025

[International Master of Science in Agro- and Environmental Nematology](#)

crdts

4

offering

A

Teaching languages

English

Keywords

DNA structure, gene expression, gel electrophoresis, PCR, cloning, restriction enzyme, hybridisation, DNA sequence, DNA polymorphisms, genetic engineering.

Position of the course

Basic course in molecular biology as preparation to

- Nematode systematics and molecular phylogenetics
- Molecular aspects of plant-nematode interactions

The aim of this course is to give the student knowledge of and insight in gene structure, gene expression and the most widely used molecular techniques

Contents

- 1 DNA and gene structure, gene expression
- 2 Basic molecular biology techniques: restriction enzymes, RFLP, cloning, hybridisation, RNA and protein analysis
- 3 DNA-sequence analysis and PCR
- 4 Different methods for the detection of DNA polymorphisms
- 5 Genetic engineering
- 6 RNAi
- 7 High throughput methods (micro-array, next-generation sequencing)

Initial competences

Basic knowledge biology and biochemistry.

Final competences

- 1 Have insight into the structure of DNA, RNA, and proteins and the central dogma of molecular biology.
- 2 Explain the technical steps executed in the basic techniques used for molecular analysis.
- 3 Describe the purpose and the (dis)advantages of the basic techniques used for molecular biology.
- 4 Choose and justify an appropriate molecular technique for a certain purpose (routine analysis, diagnostics, experiment, ...).

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, Practical

Extra information on the teaching methods

Practical exercises:

2 lab sessions: DNA-extraction, PCR, restriction, agarose gel electrophoresis, polyacrylamide gel electrophoresis for protein analysis; evaluated by participation

2 computer sessions; evaluated by small report

Study material

Type: Syllabus

Name: Molecular toolbox

Indicative price: € 17

Optional: no

Language : English

Number of Pages : 120

Oldest Usable Edition : 2024

Available on Ufora : Yes

Type: Slides

Name: ppt

Indicative price: Free or paid by faculty

Optional: no

Language : English

Number of Slides : 350

Available on Ufora : Yes

References

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Course content-related study coaching

by email or personally (after the class or on appointment)

Assessment moments

end-of-term assessment

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

Oral assessment

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

Oral assessment

Examination methods in case of permanent assessment

Participation, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

Oral examination with written preparation

Calculation of the examination mark

- 80% on examination
- 20% on participation and report of practical exercises.

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