

Genetics I (C003367)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size	<i>(nominal values; actual values may depend on programme)</i>		
Credits 4.0	Study time 120 h	Contact hrs	31.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 2)	Dutch	Gent	seminar: coached exercises	6.25 h
			lecture	25.0 h
			online lecture	0.0 h
			online seminar	0.0 h

Lecturers in academic year 2020-2021

Goormachtig, Sofie	WE09	lecturer-in-charge
--------------------	------	--------------------

Offered in the following programmes in 2020-2021

	crdts	offering
Bachelor of Science in Biochemistry and Biotechnology	4	A
Linking Course Master of Science in Biochemistry and Biotechnology	4	A

Teaching languages

Dutch

Keywords

genetische analyse in prokaryoten, mutation, recombination, complementation, conjugation, transduction, transformation, gene regulation in prokaryotes, transposons

Position of the course

The course aims at confronting the student with the fundamental principles of the genetic analysis in prokaryotes. For this, relevant basic terminology is introduced and general concepts and principles are presented that can be related to the courses in gene technology and molecular biology. Further, the recombination in prokaryotes is described and the genome evolution of prokaryotic and eukaryotic genomes is discussed. The concepts are presented from an essentially genetically point of view, ie the effect of mutations, and the relevance for the curriculum will be illustrated with several practical applications.

Contents

Prokaryotes and eukaryotes: replication, transcription and translation from a genetic perspective

Genome organization in pro-and eukaryotes (chromosome, plasmids, virusses, transposons)

Genetic analysis in prokaryotes: mutants, recombination and complementation.

Differential gene expression in prokaryotes: one component systems and sigma factors

Molecular genetics of bacteriophages: Lambda as an example of a temperate phage, the molecular switch.

Horizontal gene transfer in bacteria: conjugation, transformation and transduction and their use in genetics

Mechanisms of transposition of bacterial transposons

Initial competences

Principles of organic chemistry, structural biochemistry, basic concepts of cell biology and concepts of genetics.

Final competences

- 1 The student knows and understands the elementary principles and concepts of the molecular genetics of bacteria and eukaryotes.
- 2 The student can place these principles and can apply them on genetics.
- 3 He/she can describe different forms of DNA exchange between bacteria and can argue the relevance of it on the genome structure at the one hand and on the evolution of prokaryote genomes at the other hand.
- 4 The student is able to see use extrapolate the acquired knowledge to gene technological, biochemical and molecular biological principles.

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

Lecture, seminar: coached exercises, online lecture, online seminar

Extra information on the teaching methods

The lectures are given by means of powerpoint presentations. In the work seminars, different aspects of the course will be discussed more profoundly.

Online and oncampus lectures will be alternated. The excercises will preferentially be on campus. However, we will switch to online exercises in case the COVID19 situations requires this. Info will be available on Ufora.

Learning materials and price

Dutch syllabus and ppt presentations accessible via Ufora

Molecular Genetics of Bacteria (Snyder and Champness) most recent version.

Total cost: 110Euro

References

Course content-related study coaching

Apart from the lectures, the student always has the chance to ask questions to the lecturer and his/her co-workers. During the work seminars, several aspects of the course are further discussed and illustrated in group. Students get the change through collective exercises and discussion to assess their understanding of the subject matters of teaching and also to ask questions on a more personal basis regarding parts of the course and their relation to other courses.

Evaluation methods

end-of-term evaluation

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

Written examination

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

Written examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Periodical evaluation through a one time exam. Evaluation of the course and work colleges is done through the answers on the questions in the examination (one question was exercised durig the workcollege). The evaluation is oriented towards the integrated knowledge of the student and the ability to put the acquired knowledge in a broader context. The student should be able to understand and correctly apply the basic terminology of genetics and molecular genetics.

Calculation of the examination mark

The written exam consist of open and closed questions. Students cannot pass if they did not succesfully participate in collective exercises during the work seminars.