BIO-205

Cellular and molecular biology I

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Cursus	Sem.	Type
Electrical and Electronical Engineering	MA1, MA3	Opt.
Life Sciences Engineering	BA3	Obl.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Written
Workload	90h
Weeks	14
Hours	**3 weekly**
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

The course covers the regulation of gene expression, which translates the information contained in the genome into function, by adjusting the levels and activities of mRNAs and proteins to the needs of specific cells, tissues and environments. A particular emphasis is given on experimental methods.

Content

The course contents include notably the structure of genomes, methods to analyze and manipulate DNA, genetics and functional genomics, as well as the regulation of gene expression from DNA all the way to the post-translational level. An emphasis is placed on discussing experimental approaches that allow the analysis of these processes. The weekly lectures (2 hours) are followed by theoretical exercises (1 hour). The acquisition of knowledge is assessed in a written exam.

Keywords

DNA, genome, genetics, functional genomics, gene expression, transcription, splicing, translation, mechanistic approaches, research strategies

Learning Prerequisites

Required courses

Biologie I

Recommended courses

None

Important concepts to start the course

Those covered in Biologie I

Learning Outcomes

By the end of the course, the student must be able to:

- Describe the basic organization of the genome
- Explain the fundamentals of gene expression
- Deduce conclusions from experimental data
- Realize which research methods are appropriate for solving given questions

- Propose experimental designs to investigate biological questions
- Interpret an experimental result.

Teaching methods

The course is organized in two-hours of lectures plus one-hour of exercises each week. Teaching assistants are present during the exercise sessions.

Expected student activities

In addition to attending the lectures and participating actively to the exercises, students are expected to read the chapters of Alberts indicated by the teachers and that are relevant for the course. Two hours of personal study per week are expected.

Assessment methods

Written exam

Supervision

Others	By email appointment

Resources

Bibliography

Molecular Biology of the Cell, 5th edition
Alberts et al., 2007
Garland

Ressources en bibliothèque

- Molecular Biology of the Cell / Alberts

Notes/Handbook

The lecture slides will be made available through Moodle.

Prerequisite for

Integrated laboratory in Life Sciences