

Biology

Genetics of the eukaryote cell

IDENTIFICATION

CODE : BS-4-S1-EC-
BMGENEU
ECTS : 4.0

HOURS

Lectures : 22.0 h
Seminars : 0.0 h
Laboratory : 28.0 h
Project : 0.0 h
Teacher-student
contact : 50.0 h
Personal work : 50.0 h
Total : 100.0 h

ASSESSMENT METHOD

2 x 2h

TEACHING AIDS

TEACHING LANGUAGE

French

CONTACT

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AIMS

At the conclusion of this module the student will have to possess good theoretical knowledge and practises methods on the base of the molecular biology and the main concepts of the molecular genetics allowing him to fit as biocomputer specialist in a laboratory of research or development specialized in the domain.

The educational objectives of this module are:

- to bring the fundamental theoretical knowledge about molecular biology and the main concepts of molecular genetics .
- to learn basic concepts and technics in genetic and protein engineering .
- to learn to elaborate, plan and organize experimental work.

CONTENT

Part 1. CM Regulation of eucaryotic gene transcription

- RNA polymerases - regulatory sequences in cis - transactivators - coactivators- histone modification - chromatin remodeling - chromatin structure - chromatin structure and transcription - maturation of Eukaryotic mRNAs - Coding of genetic information - Epigenetic regulations (post-translational changes in histones and microRNA) - Genetic regulation of development - Transient transgenesis (Rnai) and genome editing (CRISPR-Cas9)

Part 2. Methods in eucaryotic molecular biology

- Physico-chemical methods - Gene cloning and gene libraries - Cell transfection
- Animal and plant transgenesis.

Part 3. Technics (practices)

- DNA sequencing, sequence analysis (bioinformatic) - Molecular hybridization - Recombinant protein production in prokaryotic system - Tagging and targeting - Site-directed mutagenesis.

BIBLIOGRAPHY

1. Molecular cell biology [4ème edition] - Lodish et al. - Freeman and Compagny - 2000
2. Molecular cloning : a laboratory manual [3ème édition] - Sambrook and Russel - CSHL Press - 2001
3. Introduction à l'analyse génétique - Griffiths AJF, Miller JH, Suzuki DT, Lewontin RC, Gelbart WM - De Boeck Université, Paris - 1997
4. Genes VII - Lewin B. - Oxford University Press, Oxford - 2000
5. Molecular Biology of the Cell - Alberts B, Johnson A, Lewis J, Raff M, Roberts K, Walter P - Garland Science, New York - 2002