

Biologie moléculaire de la cellule, Biologie cellulaire 1

Lecturer

Xavier BISTEAU (Coordinator)

Course mnemonic

BIOL-G2203

ECTS credits

5 credits

Language(s) of instruction

French

Course period

First term

Campus

Erasme

- > Describe and explain cellular interactions and the role of the extracellular matrix
- > Describe and explain the mechanism of cell division
- > Describe and explain the mechanism of movement of a eukaryotic cell
- > Describe and explain the flow of genetic information in the cell (DNA - RNA - proteins)
- > Describe and explain the regulation of gene expression (RNA maturation, splicing, RNA editing, small RNA, methylation...)
- > Understand, describe and explain the consequences of gene deregulation or deregulation of cellular mechanisms: Concrete examples of pathologies
- > List and describe the functions of the main classes of proteins and molecules involved in the control of different biological processes and their deregulations.
- > Describe and explain the techniques for studying a cell and propose their use to study/observe a cellular mechanism.

Course content

- 1 The cell, from prokaryote to eukaryote, and model organisms
- 2 The DNA, composition and organization.
- 3 Genomes and the genome structure
- 4 The DNA Replication
- 5 The DNA repair
- 6 The rranscription
- 7 RNAs
- 8 RNA maturation
- 9 The regulation of gene expression
- 10The translation
- 11Biological membranes
- 12The nucleus and endomembrane systems
- 13The cytoskeleton, Microtubules, Microfilamenste and intermediate filaments.
- 14Junctions and contacts between cells and the cellular environment
- 15Cell division, mitosis and meiosis.
- 16Mitochondria
- 17Protein sorting and addressing
- 18Introduction to molecular and cell biology techniques and their application

Objectives (and/or specific learning outcomes)

- > Describe and explain the structural and functional organization of the animal cell (organelles, cell membranes, cytoskeleton)

Pre-requisites and co-requisites

Pre-requisites courses

BIOL-G1102 | Biologie générale (Module I) | 5 crédits and BIOL-G1103 | Biologie des organismes et du développement (Module II) | 10 crédits

Courses having this one as pre-requisit

BMOL-G3307 | Génétique humaine, Biologie cellulaire II | 5 crédits and BMOL-G3310 | Biotechnologie et Initiation à la recherche | 5 crédits

Teaching method and learning activities

Ex-cathedra course in person. This theoretical course will be enhanced by concrete examples of pathologies and research related to biomedical training. Possibility of discussions of scientific articles and seminars with expert speakers. Use of Wooclap interactive module.

Contribution to the teaching profile

- > Acquire and master basic scientific knowledge related to the biomedical field at the cellular and molecular levels
- > Opportunity to develop scientific curiosity as well as the rigor and analytical method necessary in the biomedical field
- > Master the learning of physiological reasoning
- > Know how to present examinations and reports
- > Become familiar with the know-how, observation and manipulation that are the basis of our scientific training
- > Learn the vocabulary, understand the roles, impacts and use of biological concepts/elements:

- › Describe the structure of the main organelles of a eukaryotic cell
- › Describe the different functions of these organelles
- › Name the classes of genes and proteins involved in these functions and their respective roles
- › Establish the functional link between certain genetic alterations, the cellular and molecular mechanisms involved and the pathological consequences for the organism

References, bibliography and recommended reading

- ¹ Molecular Cell Biology (9th edition, 2021) Lodish, et al. Disponible également en version française : Biologie moléculaire de la cellule.
- ² Molecular biology of the cell (6th edition, 2017) Alberts et al. Disponible également en version française Biologie moléculaire de la cellule (6e#me édition)

Course notes

Université virtuelle

Other information

Place(s) of teaching

Erasme

Contact(s)

Xavier Bisteau, IRIBHM, ULB campus Erasme, 808 route de Lennik, 1070 Bruxelles. E-mail : xavier.bisteau@ulb.be

Evaluation method(s)

Oral examination

Oral examination

Open question with long development

Determination of the mark (including the weighting of partial marks)

A single, global rating

Main language(s) of evaluation

French

Programmes

Programmes proposing this course at the faculty of Medicine

BA-BIME | Bachelor in Biomedical sciences | unit 2

