Génétique humaine, Biologie cellulaire II

Lecturers
Xavier BISTEAU (Coordinator) and Isabelle MIGEOTTE

Course mnemonic
BMOL-G3307

ECTS credits
5 credits

Language(s) of instruction
French

Course period
Second term

Campus
Erasme

Course content

This teaching unit is composed of 2 leaning activities:

"Human genetics" (24h – Isabelle Migeotte).

Historic and impact of the genetics – Molecular and cellular genetics - Structure and function of the human genome – Gene and genomes expression - Genomics in human and animal health – Diagnostics techniques– Heredity - Genetic diseases – Genetics of the populations

« Cellular Biology II » (20h Th, 10h TP - Xavier Bisteau).

Intracellular signalisation – Receptors et canals. Control of the cell cycle. The circadian rhythm. The cellular death – Types et mechanisms. Molecular bases of the oncogenesis. Tumoral progression. Tissues and cellular models – Stem cells – 2D/3D Culture . Cellular and tissular alteration in human pathology.

Objectives (and/or specific learning outcomes)

At the end of this course, the student will be able to

- Describe and explain the mechanisms that control cell populations.
- Describe and explain the regulations of these mechanisms et their pathological consequences.
- Number and describe the functions of the main classes of proteins and molecules implicated in the control of different pathways and deregulations.
- Describe the diagnostics and therapeutic development in these various fields and the mode of action of new therapeutic approaches
- Able to understand the traits heredity, illustrated of examples including human genetic diseases
- Understand the concepts of analytical methods of genetic variants responsible of normal and pathological hereditary traits.
- Describe and explain a practical experiment of various fundamentals techniques of molecular biology frequently used in human genetics

Pre-requisits and co-requisits

Pre-requisites courses

BIOL-G2203 | Biologie moléculaire de la cellule, Biologe cellulaire 1 | 5 crédits

Courses having this one as pre-requisit

BMOL-G4401 | Signalisation intracellulaire et pathologies | 5 crédits and BMOL-G4417 | Genic expression and Oncology | 5 crédits

Teaching method and learning activities

Course of human genetics, theory (24h) and Cellular biology II (20h) : Ex cathedra teaching

Practical work of cell biology (10h) will consist on *the discovery of cell culture and directed and personal/group exercises, related to the development of strategies and learning by problem/project. Completion of a guided assignment related to the course material and oral presentation in class.*

Contribution to the teaching profile

- Acquire and master basic scientific knowledge of fundamental sciences linked to biomedical field at molecular and cellular level
- Opportunity to develop the scientific curiosity as well as the rigor and the necessary analytical method in biomedical field.
- Master the learning of physiological thinking
- Able to present exams and reports. Problems solving
- Being familiar with the know-how, the observation, the manipulation, the base of our scientific formation
- Master the statistical methods and/or epidemiological.
- Able of time management. Establish priorities.

References, bibliography and recommended reading

Cell Biology :

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)

Human Genetics :

1) Emery's elements of Medical Genetics (ISBN10-0702079669)

2) New Clinical Genetics (ISBN10-1911510703)

3) Génétique Médicale - Enseignement thématique (ISBN-978-2-294-74521)

4) Génétique et Biotechnologie (ISBN 978-2-7298-7615-9)

Course notes

Université virtuelle

Other information

Place(s) of teaching

Erasme

Contact(s)

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Isabelle Migeotte E-mail : isabelle.migeotte@ulb.be

Evaluation method(s)

written examination, Oral examination, Oral presentation and Group work

Evaluation method(s) (additional information)

Human genetics, theory (24h): Written assessment - Multiple choices.

Biologie cellulaire II (20h+10h TP) : Oral assessment on the theory and oral presentation of the guided group work.

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

Each of the learning activities leads to a personal notation on 20. The teaching unit (UE) is considered successful if the notation > or = 10/20. Both activities contributes equally to the final notation. The final notation of the teaching unit will calculated using the harmonic mean of both learning activities. The note of learning activities equal or superior to 10/20 will be reported to the next session among a same academic year, as well as during 2 academic years that follows their obtention.

Main language(s) of evaluation

French

Programmes

Programmes proposing this course at the faculty of Medicine

BA-BIME | Bachelor in Biomedical sciences | unit 3