UCLouvain

wfarm1221

2020

Biochemistry and molecular biology

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

10 credits	75.0 h + 37.5 h	Q1

Teacher(s)	Delzenne Nathalie (coordinator) ;Lemaigre Frédéric ;Mingeot Marie-Paule ;
Language :	French
Place of the course	Bruxelles Woluwe
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	Sub-sections : - A. General aspects : physico-chemical aspects of biochemical processes (including enzyme kinetics and classification, bioenergetics); - B. Molecular Biology (in Eukarya) : from genes to active proteins (structure and regulation); interest of molecular biology in diagnosis and drug development. - C. Metabolism : description, regulation, and tissue specificity of key anabolic and catabolic pathways. - D. Integrated view of metabolic pathways in the whole organism; modulation in several (patho)physiological situations.
Aims	1 1. To acquire fundamental knowledge in biochemistry (including molecular structures, bioenergetics, enzyme kinetics, molecular biology) and metabolism. 2. To include this knowledge in specific fields of pharmaceutical sciences (medicinal biochemistry, drug metabolism, pharmacology, toxicology, nutrition). 3. To acquire an integrative approach of metabolic regulation (relations between metabolic pathways, adaptation to specific physiological situations) 4. To evaluate the relevance of new techniques (molecular biology) in the discovery of drugs and new targets. - - - - *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Students will be evaluated on their ability to synthesize and integrate several biochemical data into a coherent entity. They must be able to describe, use and explain in accurate biochemical terms the topics addressed. The written examination, on site, will consist of open-ended questions. The final mark of the exam results from the global evaluation of the exam, not from the mathematical sum of points collected at individual questions.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Lectures, on site. Exercice sessions will be organized online, practical courses will be given on site.
Content	A. Principles of chemistry applicable to biological processes. Concepts of molecular interactions, enzyme kinetics, and bioenergetics in the context of drug discovery (drug metabolism, signal transduction, synthetic peptides, development of enzyme inhibitors). B. Structure and functions of genes and nucleic acids; genome replication; principles/regulation of gene expression and protein synthesis in eucaryotes and procaryotes. C Description and regulation of carbohydrates, lipids, amino-acids , and nucleotides metabolism at the molecular, cellular and tissue level ; control of energy homeostasis; hormonal regulation and cell signaling; metabolic fluxes. D. Metabolic adaptation to physiological situations (such as nutritional status, stress); illustration of inter-organs cooperation (liver, adipose tissue, muscle, brain). Practical courses and exercise sessions allow: - to master the content of the courses without need for extensive memorisation - to become acquainted with the principles of biochemistry through the analysis of data in the scientific literature - to practically address the principles of biochemistry through experimental approaches (enzymes kinetics)
Inline resources	The slides presented during the lectures, as well as the information and documents related to practical courses and exercise sessions are available on MoodleUCL (https://moodleucl.uclouvain.be/).

Other infos	Prerequisits: knowledge in general biology and cell biology, organic and general chemistry. Teaching by 3 professors and one assistant. Participation to the practical laboratory courses is obligatory. Unjustified absence will be sanctioned and may lead to mark of 0/20 at the final exam. In case of repeated unjustified absence, teachers may ask the jury to refuse registration to the exam according to article 72 of the RGEE
Faculty or entity in charge	FASB

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Pharmacy	FARM1BA	10	WMD1106 AND WMD1120P AND WMD1006	