

10.00 credits

75.0 h + 37.5 h

Q1

Teacher(s)	Delzenne Nathalie (coordinator) ;Lemaigre Frédéric ;Lorent Joseph ;
Language :	French
Place of the course	Bruxelles Woluwe
Prerequisites	<i>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.</i>
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.
Learning outcomes	At the end of this learning unit, the student is able to : 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.
Evaluation methods	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. The assessment is based on the knowledge acquired in the three parts of the course. A prerequisite for passing the exam is sufficient knowledge of all three parts of the course.
Teaching methods	Lectures, on site. Exercise and lab sessions will be organized 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; notions of epigenetics. 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. 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	Prerequisites: 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

