UCLouvain

wdent1255

2020

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).

3 credits	30.0 h	Q1

Teacher(s)	Bommer Guido ;Collet Jean-François ;Lemaigre Frédéric (coordinator) ;Rider Mark ;
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	This teaching unit presents the basic principles of metabolic biochemistry as well as a selection of human biochemistry topics deemed relevant for the training of dentistry students. The human biochemistry chapters include a description of normal biochemical mechanisms, as well as illustrations of disturbances at the origin of human pathologies. More specifically, the following themes will be addressed: • Reminder of the principles of thermodynamics • Structure and function of hemoglobin • Introduction to enzymes • Principles of enzymatic kinetics • Principles of metabolic control • The way of glycolysis • Glycogen metabolism • The citric acid cycle (Krebs cycle) • Amino acid metabolism • Metabolism of fatty acids • Biochemistry of bile (bilirubin, bile salts) • Mechanisms of gene expression and pathologies linked to gene dysfunctions
Aims	• Determine the type of enzyme involved at different levels of a metabolic pathway and identify the steps most likely to undergo regulation. He must also be able to explain how energy is recovered by Krebs cycle, and in what form it is exchanged within the cell. • Explain, in molecular terms, the transport of oxygen by hemoglobin. • Describe the pathways of glucose degradation and glycogen synthesis and degradation • Describe the key reactions of amino acid metabolism • Describe the pathways and regulation of the synthesis and degradation of fatty acids, triglycerides, ketone bodies. • Describe the pathways and regulation of cholesterol and bile salt synthesis, in relation to the anatomy of the digestive system. • Describe the degradation pathway of heme, in normal and pathological conditions, in relation to digestive anatomy • Explain, in molecular terms and by means of examples, how pathology can result from an abnormality in gene expression • Describe the synthesis, transport, degradation and role of plasma lipoproteins - - - - *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 biochemistry data into a coherent synthesis. They must be able to describe, use and explain in precise biochemical terms the topics addressed and how a disease can result from molecular and biochemical dysfunctions. The written examination will consist in part of a multiple-choice questions and in part open-ended questions. For multiple choice questions with more than one correct option, the mark will only be attributed if all the correct responses have been selected. There are no negative points or weighting according to the questions and chapters of the subject. However, when a student has a final mark between 9/20 and 10/20 after correction, the lecturers review together the exam copy to decide whether the mark should be rounded down or up according to the overall evaluation of the copy.

Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Lectures, on site
Content	The course presents the basic principles of biochemistry as well as a series of human biochemistry themes considered as relevant to the training of students in Dentistry. The chapters on human biochemistry include a description of normal biochemical mechanisms, as well as illustrations of disorders that cause human pathologies. More specifically, the following topics will be addressed: Reminder of the principles of thermodynamics Structure and function of hemoglobin Introduction to enzymes Principles of enzyme kinetics Principles of metabolic control The glycolytic pathway and glycogen metabolism The tricarboxylate cycle (Krebs cycle) Amino acid metabolism Fatty acid metabolism Bile biochemistry (bilirubin, bile salts) Mechanisms of gene expression and diseases related to gene dysfunctions
Inline resources	The slides presented in the course, which cover the subject in a comprehensive way, are available on MoodleUCL (https://moodleucl.uclouvain.be/). In addition, a tablet will be used to explain certain aspects of the course. The "Tablet" versions of the PowerPoint files will also be made available to students via MoodleUCL.
Bibliography	D.R. Ferrier: Biochemistry. Lippincott Illustrated Reviews. Wolters Kluwer. 2017 Voet et Voet "Biochimie" 2e édition 2007, traduction de la 3e édition américaine par Guy Rousseau et Lionel Domenjoud Textbook of Biochemistry with Clinical Correlations, 7ème édition, Thomas M. Devlin
Faculty or entity in charge	MDEN

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Dentistry	DENT1BA	3	WMEDE1101 AND WDENT1111 AND WMDS1105 AND WMEDE1112	