UCLouvain

wfarm1300

2023

Pharmacokinetics and metabolism of xenobiotics

4.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Delzenne Nathalie ;Elens Laure ;
Language :	French > English-friendly
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	The course is divised in two parts. The first part deals with the different enzymatic systems that drive to metabolize exogenous molecules in the body (phases I and II). These processes allow to eliminate these compounds. The second part of the course presente several aspects of the phamacokinetics field, including the qualitative and quantitative description of the drug absorption, distribution and elimination processes.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 At the end of this teaching unit, the student will be able: - To precisely describe and implement the various components that drive the fate of a xenobiotic in the body (mainly a drug or an environmental toxic). - To use the acquired tools to predict the metabolic fate of a xenobiotic, using the rules seen in class. - To execute the kinetic computation formulations learned throughout the course to characterize, compare and discuss the drug pharmacokinetic profile from clinical data. - To appropriately interpret the obtained values and discuss the results using the acquired theoretical knowledge. - To precisely describe the fate of a xenobiotic whatever the administration way and to be able to select the best administrative way in a specific setting. - To collect, analyze, formulate critics, summarize and present clearly scientific information related to the metabolic and pharmacokinetic fate of a drug compound. - To discuss the consequences that the ADME process may have on a drug's therapeutic efficacy and/or toxicological side-effects (ADME stands for absorption, distribution, metabolization and excretion).
Evaluation methods	The assessment aims to measure the achievement of the learning outcomes targeted, via a written exam and the writing of a paper by groups of 2 to 3 students, all in French. The work is to be handed in on Moodle before the beginning of the session, on a date communicated to the students. The final grade is the weighted average of the metabolism, pharmacokinetics and assignment parts. In the final grade, the metabolism part is worth 6/20, the pharmacokinetics part is worth 10/20 and the assignment is worth 4/20.In a second presentation session, work with a mark < 12/20 must be improved and resubmitted. A mark of > or equal to 12/20 will be extended for that session. If the student is required to re-register for the course, he/she will have to submit a new piece of work. It is the student's responsibility to enquire about their grade and the need for resubmission.
Teaching methods	Audience lectures, tutorials, exercise sessions
Content	T 1. Metabolism of xenobiotics The course is structured in 4 chapters which mainly include the description of the enzymatic systems involved (enzymology, coenzyme, interaction with intermediary metabolism, establishment of general rules for the recognition of substrate functions). Specific examples are used to illustrate particular aspects, such as the toxicological implication of a reaction or the consequences for the establishment of dosage, the implication of particular metabolic or nutritional situations or the therapeutic and toxicological consequences of inter-individual differences. 2. Pharmacokinetics In this part of the course, the qualitative and quantitative aspects of the processes of absorption, distribution and elimination (metabolism and excretion), i.e. ADME, of drugs are developed. A development of the phase III processes and the role of the different proteins involved (MDR or ABC, MRP, P-glycoproteins.) is also part of the subject. This subject is essential to deal in later years with the application of pharmacokinetics in the rational use of drugs in patients, i.e. clinical pharmacokinetics. The appropriation of the concepts presented in the theoretical lectures is stimulated by tutorials, which consist of problem-based learning of the different parts of the course and by the preparation of an assignment in groups of 2

	to 3 students. In this assignment, the students analyse and present the metabolic fate of a therapeutic substance in the light of literature data.
Bibliography	Les diapositives projetés lors des cours magistraux et des séances d'exercices sont disponibles sur la plateforme Moodle UCL. The slides projected during the lectures and exercise sessions are available on the UCL Moodle platform.
Other infos	Participation in tutorials and exercise sessions is highly recommended to validate the unit as a significant part of the examination
Faculty or entity in charge	FARM

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Pharmacy	FARM1BA	4	WFARM1221 AND WFARM1213	🔍