

Pharmacokinetics and metabolism of xenobiotics - Pharmacokinetics and metabolism of xenobiotics (metabolism part)

2.00 credits

10.0 h + 20.0 h

Q1


Teacher(s)	Bindels Laure (compensates Delzenne Nathalie) ;Elens Laure ;
Language :	French
Place of the course	Bruxelles Woluwe
Prerequisites	To follow this course the students should have a good basic knowledge of mathematics, chemistry, biochemistry, molecular biology, physiology, anatomy and microbiology.
Main themes	<p>The course is divided in two parts. In the first part (Drug Metabolism) the biochemical pathways and reactions involved in drug metabolism are explained. The different phase I and phase II reactions are described from a chemical/biochemical standpoint. In addition, the various factors affecting the activity of the phase I and phase II drug metabolizing enzymes are highlighted by using practical examples. The therapeutic consequences of drug metabolism are illustrated.</p> <p>In the second part of the course (Pharmacokinetics) the basic principles and concepts underlying the processes of drug absorption, distribution and elimination (metabolism and excretion), i.e. the ADME pathway, are described in detail. In this section, Phase III transporter proteins and their role in pharmacokinetics (P Glycoprotein, MRP¹) are also detailed. In addition, quantitative pharmacokinetics and mathematical methods (e.g. trapezoidal rules) to calculate basic pharmacokinetic parameters such as bioavailability, clearance, volume of distribution, half-life etc, are developed. Much emphasis is placed on the correct interpretation of these pharmacokinetic parameters which is important for the rational use drugs in pharmacotherapy.</p> <p>Tutorials are organized to illustrate different aspects of the theoretical course. For Drug Metabolism the students (in groups of two) have to prepare a summary report on the metabolic fate of a particular drug substance in humans based on the information available in the scientific literature. For Pharmacokinetics the students have the possibility to learn the mathematical methods used to calculate pharmacokinetic parameters by solving a number of practical problems.</p>
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>1 The objective of this course is to give the students the necessary information to understand the fate of a xenobiotic in the body and its consequences for the clinical efficacy and potential toxicity of therapeutic agents.</p>
Evaluation methods	Students are evaluated on their performance during the tutorials (drug metabolism report). Their theoretical knowledge of the course material is evaluated through a written exam.
Teaching methods	Audience lectures, tutorials, exercise sessions
Content	<p>The course is divided in two parts. In the first part (Drug Metabolism) the biochemical pathways and reactions involved in drug metabolism are explained. The different phase I and phase II reactions are described from a chemical/biochemical standpoint. In addition, the various factors affecting the activity of the phase I and phase II drug metabolizing enzymes are highlighted by using practical examples. The therapeutic consequences of drug metabolism are illustrated.</p> <p>In the second part of the course (Pharmacokinetics) the basic principles and concepts underlying the processes of drug absorption, distribution and elimination (metabolism and excretion), i.e. the ADME pathway, are described in detail. In this section, Phase III transporter proteins and their role in pharmacokinetics (P Glycoprotein, MRP¹) are also detailed. In addition, quantitative pharmacokinetics and mathematical methods (e.g. trapezoidal rules) to calculate basic pharmacokinetic parameters such as bioavailability, clearance, volume of distribution, half-life etc, are developed. Much emphasis is placed on the correct interpretation of these pharmacokinetic parameters which is important for the rational use drugs in pharmacotherapy.</p> <p>Tutorials are organized to illustrate different aspects of the theoretical course. For Drug Metabolism the students (in groups of two) have to prepare a summary report on the metabolic fate of a particular drug substance in humans based on the information available in the scientific literature. For Pharmacokinetics the students have the possibility to learn the mathematical methods used to calculate pharmacokinetic parameters by solving a number of practical problems.</p>

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.

Bibliography	
Other infos	Powerpoint slides and scientific articles are available for the students to help them in assimilating the course material.
Faculty or entity in charge	FARM

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [60] in Biomedicine	SBIM2M1	2		
Master [120] in Biomedicine	SBIM2M	2		