

Physiology Pharmacology

Pharmacology 1 : ADMET and Compartmental Models

IDENTIFICATION

CODE : BS-4-S2-EC-COPHAR1
ECTS : 2.0

HOURS

Lectures : 8.0 h
Seminars : 14.0 h
Laboratory : 0.0 h
Project : 0.0 h
Teacher-student
contact : 22.0 h
Personal work : 28.0 h
Total : 50.0 h

ASSESSMENT METHOD

Continuous évaluation of laboratory
work 1 x 2h 2 written and oral
reports

TEACHING AIDS

duplicate course material
in line documents for the BIOPHAR
collective project

TEACHING LANGUAGE

French

CONTACT

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AIMS

Course:

Describe the different steps in drug discovery and development process.

Describe the parameters that affect the kinetics for drug absorption and distribution in the body.

Describe the important metabolic pathways for drugs in humans and animals and how drugs and/or metabolites are eliminated from the body.

Describe the mechanisms responsible for drug activity and explain how individual characteristics can influence pharmacokinetics and activity.

Laboratory work:

Use different in vivo, ex vivo and in vitro models for drug activity evaluation.

Collective BIOPHAR project (with the participation of DOC'INSA):

Complete, by groups of 4-6 students, a bibliographic research (scientific and economical aspects) on a given drug and present an experimental protocol to study its pharmacological activity, pharmacokinetic properties or metabolism.

CONTENT

CM: Teaching on two aspects of pharmacology: 1, Becoming a drug in the body: absorption, distribution, metabolism and elimination [ADME]. and 2, Pharmacokinetics: 1 and 2-compartment models.

ADME: Variations in drug sensitivity. Models and methods of study, interests and limitations. Metabolism of xenobiotics. Main biotransformation pathways and stages, mono-oxygenates.

The main conjugation reactions and their targets. Modulating factors of biotransformation: physiological and behavioural factors, induction, polymorphism.

pharmacokinetics. Fundamental concepts and goals. Compartmental and non compartmental pharmacokinetics. Modelling of a simple two-compartment system and simulations.

Estimation of model parameters and forecasts. Infusion models, oral intake and bioavailability.

General principles of toxicology.

TP: measurements of parameters on a 1 compartment model after oral ingestion/infusion/bolus iv.

BIBLIOGRAPHY

Goodman and Gilman's The Pharmacological Basis of Therapeutics - L.S. Goodman - McGraw-Hill, P 2006

Modern Pharmacology with clinical applications - C.R. Craig and R.E.Stitzel - Little Brown and Co - 1997

Conjugaison reactions in Drug Metabolism - G.J. Mulder - Taylor et Francis, London - 1990

Biotransformations - D.R. Hawkins - The Royal Society of Chemistry, London - 1994

Pharmacokinetics - M. Gibaldi, D. Perrier - Marcel Dekker Publisher - 1993

PRE-REQUISITE

Good background in chemistry, biochemistry and physiology.