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| **Course code:**  **FFS50** | **Course title:**  **PHARMACOKINETICS** | | |
| **Level:**  **Undergraduate** | **Year:**  **IV** | **Semester:**  **VII** | **ECTS credits:**  **4** |
| **Status:**  **Obligatory** | **Number of hours weekly:**  **2+2** | | **Total hours of teaching: 60** |
| **Teaching staff:** | Selma Škrbo, PhD, associate professor  Naida Omerović, MPharm, teaching and research assistant | | |
| **1. Course objectives:** | Introducing students to pharmacokinetic processes that drugs undergo after their administration: absorption, distribution, metabolism and elimination and factors altering them (factors of a drug and factors of an organism), mathematical treatment of drug blood level–time data: calculations of pharmacokinetic parameters using a model-dependent and a model-independent approach, design of a dosage regimen while ensuring high-quality, safe and effective pharmacotherapy, concept of bioavailability and bioequivalence: methods of bioavailability assessment and its relevance to development of new drugs and new dosage forms. | | |
| **1.1. Curriculum:**  **a) Lectures:**  Introduction to pharmacokinetics. Place of pharmacokinetics in modern science. Routes of drug administration. Factors altering drug absorption. Methods of drug lipophilicity and drug permeability testing. Gastrointestinal drug absorption. Drug distribution. Drug biotransformation and drug elimination. Renal drug excretion. Non-renal drug excretion. Compartmental (model-dependent) pharmacokinetic analysis: one-compartment and two-compartment models. Non-compartmental (model-independent) pharmacokinetic analysis. Pharmacokinetics of multiple dosing. Non-linear pharmacokinetics. Dosage regimen design and dose adjustment. Therapeutic drug monitoring. Bioavailability and bioequivalence. Biopharmaceutical drug classification system. *In vitro*/*in vivo* correlation.  **b) Practical work:**  Exponents and logarithms, calculus and graphs. Rates and orders of reactions. Compartmental (model-dependent) pharmacokinetic analysis: one-compartment model, intravascular route of drug administration. Compartmental (model-dependent) pharmacokinetic analysis: one-compartment model, extravascular route of drug administration. Compartmental (model-dependent) pharmacokinetic analysis: two-compartment model, intravascular route of drug administration. Compartmental (model-dependent) pharmacokinetic analysis: two-compartment model, extravascular route of drug administration. Calculations of pharmacokinetic parameters from urinary excretion data. Intravenous infusion. Non-compartmental (model-independent) pharmacokinetic analysis. Bioavailability and bioequivalence. | | | |
| **1.2. Learning outcomes:** | Students are expected to understand the following: basic principles of pharmacokinetic processes and factors altering them, different methods of pharmacokinetic analysis, factors affecting pharmacological response, methods of bioavailability assessment and pharmacokinetic drug interactions and adverse drug reactions occurring during concomitant drug therapy. | | |
| **2. Course organization:** | | | |
| **2.1. Structure of the course:** | 1. Lectures  2. Practical work | | 1. 50%  2. 50% |
| **2.2. Grading:** | 1. Two practical laboratory colloquiums  2. Practical knowledge assessment  3. Two term exams | | 1. 10%  2. 10%  3. 80% |
| **3. Literature:** | | | |
| Mandatory:   1. PowerPoint presentations, different handouts 2. Shargel, L. and Yu, A. eds., (2015). Applied Biopharmaceutics and Pharmacokinetics. New York: McGraw-Hill.   Additional:   1. Persky, A.M. and Pollack, G.M. (2017). Foundations in Pharmacokinetics. Chappel Hill: the University of North Carolina at Chapel Hill Eshelman School of Pharmacy. | | | |