

<b>Level:</b> Specialist				
<b>Course title:</b> Advanced course in metabolism of drugs and xenobiotics				
<b>Status:</b> elective				
<b>ECTS:</b> 5				
<b>Requirements:</b> none				
<b>Learning objectives</b> To introduce students to the principles of drugs and biotransformations of xenobiotics by cytochrome P450 and other oxigenases. To introduce students to enzyme systems participating in the most important biotransformation reactions – oxidoreductions.				
<b>Learning outcomes</b> After completing the course, acquired knowledge and skills related to drugs and xenobiotics metabolism will enable students to work in biochemical laboratories, including those of pharmaceutical industry.				
<b>Syllabus</b> <i>Theoretical instruction</i> Drugs classification. Mixed-function oxidases (MFO) and cytochrome P450. Main pathways of drugs biotransformation by MFO system: acyclic and aromatic compounds hydroxylation, N-oxidation, oxidative deamination, O-dealkylation etc. Cytochrome P450 structure. Cytochrome P450 catalytic cycle. Cytochrome P450 electron-transfer partners, electron-transfer mechanism. Molecular oxygen activation by cytochrome P450. Cytochrome P450 inhibitors and inductors. Metabolism and bioactivation of arachidonic acid and eicosanoids (NADPH-independent and NADPH-dependent reactions, alkene epoxydation, etc.). Human cytochrome P450. Plant cytochrome P450. Diversity and importance of microbial cytochrome P450. Fundamentals of main drug classes (antibiotics, cytostatics etc.) pharmacokinetics and pharmacodynamics. Determination of selected drugs and antimetabolites biological activity. Methods for detection of main drug classes and their metabolites. Factors that affect drug metabolism.  <i>Practical instruction</i> Analysis and discussion of the selected literature. Cytochrome P450 <i>in vivo</i> determination in absence and presence of inductors and inhibitors. Visits to pharmacological and pharmaceutical laboratories.				
<b>Weekly teaching load</b>				Other:
Lectures: 2	Exercises:	Other forms of teaching: 2	Student research:	