

Medicinal chemistry at Faculty of Pharmacy of UVPS Brno

Medicinal Chemistry I: 2nd year summer semester

Lectures:

General topics:

- history
- nomenclature
- physico-chemical properties and activity
- structural features and activity
- structure modifications: homology, analogy, isosterism...
- drugs biotransformation
- prodrugs
- drugs research, development, patents & good practices

Special topics

- weak and strong analgesics & antiinflammatory drugs
- general & local anaesthetics, muscle relaxants
- CNS agents: antipsychotics, antineurotics, antidepressants, stimulants, cognitive enhancers, hallucinogens
- sedatives, hypnotics, antiepileptics, antivomitics, antikinetics
- adrenergic receptors' agonists and antagonists

Medicinal Chemistry I: 2nd year summer semester (February - May)

Seminars: every Tuesday from 7.30 (compulsory!)

- introduction into the discipline
- syntheses and metabolism of selected weak analgesics and NSAIDs
- syntheses of some opioid receptors' ligands
- syntheses and metabolism of some local & general anaesthetics
- history and syntheses of platinum anticancer drugs
- syntheses of some adrenergics & anobesics
- syntheses and metabolism of some antipsychotics
- syntheses and metabolism of some antidepressants
- syntheses of selected adrenergic receptor antagonists
- **final test** (⇒ credit)

Medicinal Chemistry II: 3rd year winter semester

Lectures

- antibiotics & other antibacterial chemotherapeutics: sulfonamides, quinolones, nitrofuranes, tetracyclins, β -lactameantibiotics: penicilines & cephalosporins, (poly)peptide antibiotics, aminoglycoside antibiotics, macrolide antibiotics etc.
- antituberculotics & antileprotics
- antiviral agents
- antimycotics
- antiparasitics: antiprotozoal & vermifugal agents; insecticides
- liver protectants, cholagogues, cholelitholytics
- drugs controlling blood clotting
- antihyperlipidemics
- drugs improving heart perfusion, cardiotonics, coronary vascular dilators
- anti-hypertensive drugs
- anti-arrhythmics, drugs for erectile dysfunction
- diuretics
- laxatives & antidiarrhoics
- antacids & anti-ulcerative agents: proton pump inhibitors, H₂-antihistamines, gastric cytoprotectants
- anticancer drugs
- insuline(s) & other antidiabetics
- hormones: derived from one amino acid, drugs for thyroid gland, peptide hormones, steroid hormones
- medicines for biologic therapy

Medicinal Chemistry II: 3rd year winter semester (September - December)

Laboratory practical classes

- **every even Thursday from 11.15, compulsory**
- synthesis of
 - an antibacterial drug (sulfacetamide)
 - a local anaesthetic (lidocaine)
 - an NSAID (acetylsalicylic acid)
 - an antiepileptic (phenytoin)
 - an antimicrobial preservative (methyl- or other paraben)
- products are characterized by a chromatography; the identity is confirmed by NMR or IR spectra
- determination of
 - pK_a of a weakly acidic drug (phenytoin or nitrofurantoin)