

Pharmaceutical / Medicinal Chemistry

Lecture-Nr.: 53801

Type: lecture

Duration: over 4 semesters (2 lecture series by 2 professors): 2 x 2 hours (4 hours) per week (winter and summer semester)

Method of Assessment: written examination

ECTS Credit Points: 4 ECTS per semester; total 16 ECTS (over 4 semesters)

Topics:

Semester 1: Vitamins: vitamins A and E, retinoic acid and analogues; B vitamins and related; ascorbic acid. Antibacterial agents (except antituberculosics): inhibitors of cell wall biosynthesis (beta-lactams, cycloserin, fosfomycin, vancomycin and related glycopeptides); polypeptides interfering with the cytoplasmic membrane (e. g. gramicidines, polymyxines); inhibitors of bacterial protein biosynthesis (tetracyclins, aminoglycosides, macrolides and ketolides, lincosamides, chloramphenicol, steroid antibiotics, oxazolidinediones); inhibitors of bacterial gyrase (quinolones); inhibitors of the biosynthesis of nucleobases (sulfonamides, benzylopyrimidines); nitroimidazoles; nitrofurantoin; aminoacridins

Semester 2: Antimycobacterial agents: isoniazide, pyrazinamide; rifamycines; ethambutol; streptomycin; 2-alkylisonicotinithioamides; cycloserin, terizidon; para-aminosalicylic acid; antileprotic agents (rifampicin, dapson, clofazimin, thalidomide). Antimycotic agents: polyen antimycotics (amphotericin, nystatin); azole antimycotics (inhibitors of lanosterol-14 α -demethylase); inhibitors of squalene epoxidase (allylamines, thiocarbamates); further inhibitors of ergosterol biosynthesis (amorolfin); flucytosin and thymidilate synthase inhibition; ciclopirox. Antiprotozoic agents: antimalaria compounds. Anthelmintic drugs.

Semester 3: Analgetic, antiphlogistic and antipyretic compounds: biosynthesis of prostaglandins and prostanoids, COX and LOX pathway, clinically used prostaglandin derivatives, COX inhibitors of different chemical classes (reversible, irreversible), COX 2-selective inhibitors; opioid receptors and their ligands (agonists, partial agonists, antagonists), compounds closely related to the morphine structure, synthetic opioid receptor ligands; nefopam, flupirtin. Antidiarrhoic opioid receptor ligands. Antitussive drugs (central, peripheral, opioid and non-opioid structures). Secretolytics and mucolytics.

Semester 4: Hormones: Pancreatic hormones (insulins, glucagon), oral antidiabetic drugs, sweeteners; hypothalamic and adenohipophyseal peptide hormones and their antagonists, prolactin inhibitors; neurohipophyseal peptide hormones (vasopressins and oxytocin); thyroid hormones including calcitonin, thyreostatics; radioiodine, technetium diagnostics, radiopharmaceuticals; parathyreotropic hormone; drugs for the treatment of osteoporosis, bisphosphonates; vitamin D and related hormones; steroid biosynthesis, glucocorticoides, mineralocorticoids, spironolacton; androgens; estrogens, antiestrogens; gestagens

Literature:

1. Beale/Block (Eds.) Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, Lippincott, Philadelphia
2. Williams/Lemke, Foye's Principles of Medicinal Chemistry, Lippincott, Philadelphia

3. Brunton/Chabner/Knollman, Goodman-Gilman's The Pharmacological Basis of Therapeutics, Mcgraw-Hill Professional, New York
4. Wermuth (Ed.), The Practice of Medicinal Chemistry, Elsevier, Amsterdam
5. Triggler/Taylor (Eds.), Comprehensive Medicinal Chemistry, Elsevier, Amsterdam
6. Klebe, Wirkstoffdesign, Entwurf und Wirkung von Arzneistoffen, Spektrum Akademischer Verlag, Heidelberg
7. Steinhilber, Schubert-Zsilavec, Roth, Medizinische Chemie, Targets und Arzneistoffe, Deutscher Apotheker-Verlag, Stuttgart
8. Mutschler/Geisslinger/Kroemer/Menzel/Ruth, Arzneimittelwirkungen, Wissenschaftliche Verlagsgesellschaft, Stuttgart
9. Eger/Troschütz/Roth, Arzneistoffanalyse, Deutscher Apotheker Verlag, Stuttgart.
10. European Pharmacopoeia
11. Voet/Voet, Biochemistry, Wiley, New York

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