Drugs: Structure and Function
16:720:583

This course will provide a survey of the major pharmaceutical agents in clinical use. Emphasis will be placed on the influence of chemical structure in the elicitation of pharmacological effects.

**Topic Outline:**

Lecture 1: Physicochemical Properties/Relation to Pharmacological Effects.
Lecture 2: Receptors/Enzyme Inhibitors/Classification of Drugs
Lecture 3-4. Drug Nomenclature
Lecture 5. Neurotransmitters and Neuroreceptors
   a) Parasympathetic
      i) nicotinic
      ii) muscarinic
   b) Sympathetic
      i) $\alpha_1$ receptors
      ii) $\alpha_2$ receptors
      iii) $\beta_1$ receptors
      iv) $\beta_2$ receptors
      v) $\beta_3$ receptors
Lecture 6. Cholinergic Agonists
   a) Direct
      i) Acetylcholine and related agonists
      ii) Muscarinic/Nicotinic
   b) Indirect
      i) Reversible
      ii) Irreversible
Lecture 7. Cholinergic Antagonists
   a) Reversible
   b) Irreversible
Lecture 8. Adrenergic Agonists
   a) $\alpha_1$ agonists
   b) $\alpha_2$ agonists
   c) $\beta_1$ and $\beta_2$ agonists
   d) $\beta_2$ agonists
Lecture 9. Adrenergic Antagonists
   a) $\alpha_1$ antagonists
   b) $\beta_1$ and $\beta_2$ antagonists
   c) $\beta_2$ antagonists
   d) Partial Antagonist with ISA
Lecture 10. Cardiovascular Drugs I: Vasodilators
a) Organonitrates
b) Calcium Channel Blockers/Calcium Antagonists
c) Miscellaneous Agents

Lecture 11. Cardiovascular Drugs II: Drugs Effecting Renin-Angiotensin System
   a) ACE Inhibitors
   b) Angiotensin II Receptor Antagonists
   c) Renin Inhibitors

Lecture 12: Cardiovascular Drugs III: Diuretics
   a) Thiazide Diuretics
   b) Loop Diuretics
   c) Potassium-sparing diuretics
   d) Osmotic Diuretics

Lecture 13. Cardiovascular Drugs IV: Cardiotonics and Antilipidemic Agents
   a) Cardiac Glycosides
   b) Inotropes
   c) Resins and Niacin
   d) Fibrates (gemfibrozil, fenofibrate, bezafibrate, clofibrate)
   e) Statins (Mevacor, Pravachol, Zocor, Lipitor)

Lecture 14. Cardiovascular Drugs V: Antiarrhythmic Agents:
   a) Class Ia-c,II,III, and IV
   b) Methods to Limit First Pass Metabolism

Lecture 15. Antihistamines (H\textsubscript{1} antagonists)
   a) H\textsubscript{1} antagonists
   b) Nonsedating Antihistamines

Lecture 16. Agents for the Treatment of Peptic Ulcers
   a) H\textsubscript{2} Antagonists
   b) Proton Pump Inhibitors

Lecture 17. CNS Stimulants
   a) Antinarcotics
   b) Anorexients
   c) Antidepressants

Lecture 18. CNS Depressants I
   a) Barbiturates
   b) Benzodiazepines

Lecture 19. CNS Depressants II
   a) Antiepileptics
   b) Antipsychotics

Lecture 20. Narcotic Analgesics

Lecture 21. Nonsteroidal Anti-inflammatory Agents (NSAIDS)

Lecture 22. Antibacterial Agents I

Lecture 23. Antibacterial Agents II

Lecture 25. Cancer Chemotherapeutic Agents I  
a) Antimetabolites  
b) Alkylating Agents  
Lecture 26. Cancer Chemotherapeutic Agents II  
a) Mitotic Inhibitors and Stabilizers  
b) Topoisomerase Inhibitors  
Lecture 27. Steroids I  
a) Nomenclature  
b) Mineralocorticoids  
Lecture 28. Steroids II  
a) Glucocorticoids  
b) Sex Hormones  

TEXTBOOKS

Required  

Other Reference Textbooks  

*Medicinal Chemistry Principles and Practice,* F.D. King, The Royal Society of Chemistry, 1994


CITERIA FOR GRADING  

There will be two exams that will be given outside of the planned lecture schedule. The mid-term exam will cover lectures 1-14. The final exam will be based upon material associated with lectures 15-28. These exams will count equally toward the student’s final grade.