

Semester V

Paper No- 11: Introduction to Biopharmacology and Pharmacokinetics Marks: 150

Pharmacology is the science concerned with the study of drugs and how they can best be used in the treatment of disease in both humans and animals. The course starts with the general considerations and lead to understanding of various drugs acting on different body systems. It is a very important biomedical discipline, with roots both in basic biology and chemistry, and plays a vital role in helping to safeguard our health and welfare.

THEORY

Total Lectures: 48

Unit I: General Pharmacology

(08 Lectures)

(Chapter 1: Tripathi; Chapter 1, 2 and 3: Rang and Dale)

Nature and Source of drugs, Routes of drug administration and their advantages, receptor and receptor subtypes.

Unit II: Pharmacokinetics

(08 Lectures)

(Chapter 2 and 3: Tripathi)

Drug absorption, distribution, metabolism, and excretion, bioavailability, First Pass metabolism, excretion and kinetics of elimination, Bioavailability, Biological half life of drug and its significance, Drug-drug interactions.

Unit III: Pharmacodynamics

(06 Lectures)

(Chapter 4: Tripathi)

Principles and mechanism of drug action, Factors affecting drug action.

General considerations, pharmacological classification, mechanism of action and uses of following classes of drugs acting on various systems.

Unit IV: Drugs acting on CNS

(10 Lectures)

(Chapter 27, 29, 34 and 35: Tripathi)

(a) Mechanism of General anaesthesia, Stages of anaesthesia, General anaesthetics (Nitric oxide, halothane), (b) Principles of hypnosis and sedatives: sedative and hypnotics drugs (Phenobarbitone, diazepam), (c) Opioid analgesics (Morphine) (d) CNS stimulants (strychnine, amphetamine).

Unit V: Brief introduction to autocooids

(04 Lectures)

(Chapter 13 and 14: Tripathi)

Drug therapy of inflammation, NSAID and other drugs (aspirin, celecoxib).

**Unit VI: Chemotherapy of microbial diseases
(Chapter 49, 50 and 57: Tripathi)**

(06 Lectures)

Antibacterial (sulfonamides), antifungal (amphotericin B).

**Unit VII: Hormones and hormone antagonists
(Chapter 18, 19 and 20: Tripathi)**

(08 Lectures)

Insulin and oral hypoglycaemic agent (tolbutamide, rosiglitazone), thyroid and anti-thyroid drugs (eltroxin, carbimazole), estrogen and progestins (progesterone, hydroxyprogesteronecaproate).

***PRACTICALS**

1. Handling of laboratory animals.
 2. Routes of drug administration (Oral, I.M.)
 3. To study the presence of acetaminophen in given sample.
 4. To study the stages of general anesthesia.
 5. To determine partition coefficient of general anesthetics.
 6. Effect of analgesic (Tail-flick test).
 7. Anti-anxiety effect of valium (Plus maze test).
 8. Fixing of organ bath and kymograph.
 9. To record CRC of acetylcholine using guinea pig ileum / rat intestine.
 10. Determination of dose ratio.
 11. Study of competitive antagonism using acetylcholine and atropine.
- *Experiments to be conducted in Virtual mode and through providing data.

ESSENTIAL BOOKS

1. Essentials of Medical Pharmacology, 7th edition (2010), K.D. Tripathi, Jaypee Brothers.
2. Pharmacology, 7th edition (2011), H.P. Rang, M.M. Dale, J.M. Ritter and P.K. Moore, Churchill Livingstone.
3. Hand book of Experimental Pharmacology, 4th edition (2012), S.K. Kulkarni, Vallabh Prakashan, 2012.