

CH S 514: MEDICINAL AND NATURAL PRODUCTS CHEMISTRY

Course Outcome

- Students will gain an understanding on the classification and nomenclature of drugs, modern theories of drug action and drug design.
- Students will be able to know classification, synthesis and mode of action of antipyretic analgesic drugs, general anesthetics, local anesthetics, cardiovascular drugs, antineoplastic agents and antiviral drugs with suitable examples.
- Students will get a good understanding of isolation, classification, methods of structure elucidation and synthesis of various types of alkaloids, terpenoids and steroids with suitable examples.

UNIT-I

[12 Hours]

Drugs: Classification and nomenclature of drugs. Theories of drug action—Occupancy theory, Induced fit theory and Perturbation theory. Analogues and Prodrugs, Factors governing drug design. Variation method of drug designing, Physico-Chemical factors and factors governing the ability of drugs.

Antipyretic Analgesics: Introduction and classification, synthesis & mode of action of Phenacetin, Cinchophen, Phenazone and Mefenamic acid.

General Anesthetics: Introduction and classification, synthesis & mode of action of methoxy fluorane, Thiopental sodium and Fentanyl citrate.

Local anesthetics: Introduction and classification, synthesis & mode of action of benzocaine, α -Eucaine, Lignocaine hydrochloride and Dibucaine hydrochloride.

UNIT-II:

[12 hours]

Cardiovascular drugs: Introduction and classification, Synthesis & mode of action of Hydralazine, Methyldopa, Diazoxide, Procainamide, and Prenylamine.

Antimalarials: Introduction and classification, Synthesis & mode of action of Chloroquinephosphate and pyrimethanin.

Antineoplastic agents: Introduction and classification, Synthesis & mode of action of Mechlorethamine hydrochloride, Methotrexate and Fluorouracil.

Antiviral drugs: Introduction and classification, Synthesis & mechanism of action of Methisazone and Amantidine hydrochloride.

UNIT-III:

[12 Hours]

Alkaloids: Classification and general methods of structure elucidation. Structure and synthesis of Papaverine, Adrenaline and Reserpine.

Terpenoids: Introduction and classification, isoprene rule and general methods of structure determination. Structure and synthesis of Menthol, α -Pinene, Camphor and Zingiberene.

Steroids: Introduction, Blanc's rule, Chemistry of Cholesterol, Oestrone and Progesterone.

References

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2. Medicinal Chemistry, G. R. Chatwal, Himalaya, (2002).
3. Principles of Drug Action, A. Goldstein, L. Aronow & S. M. Kalman, Wiley Int. Ed., 1973
4. Natural Products Chemistry, Vol-I & II, G. R. Chatwal, Himalaya, (1990).
5. Organic Chemistry, Vol I & II, I. L. Finar, Longmann ELBS, (1973).
6. Chemistry of Natural Products, Vol-I & II, O. P. Agarwal, Goel, (1985).
7. Chemistry of Natural Products: A Unified Approach, N. R. Krishnaswamy, University Press, (1999).