

CH 537: BIOCHEMISTRY AND MEDICINAL CHEMISTRY (3-0-0: 3)

Peptides

Amino acids, polypeptide and protein structure, biosynthesis of amino acids, ribosome, mechanism of protein synthesis, sequencing of amino acids in polypeptides, introduction to protein folding problems.

Nucleic Acids

Classifications, nucleotides structure and their functions, biosynthesis of nucleotides, replication of DNA, RNA transcription.

Vitamins

Classification of vitamins and their biological role, carotenoids, vitamin A, chemistry of thiamine, riboflavin, pyridoxine folic acid and ascorbic acid.

Biopolymer Interactions and Thermodynamics of Biopolymer Solutions

Forces involved in biopolymer interactions, electrostatic charge and molecular expansion, hydrophobic forces, dispersion force interactions, multiple equilibria and various types of bonding process in biological systems, hydrogen ion titration curves, thermodynamics of biopolymer solutions, osmotic pressure, membrane equilibrium, muscular contraction and energy generation in mechanochemical system.

Medicinal Chemistry

Concept of drugs and their interactions: Structure-activity relationship, lead compound and lead modification, chemotherapeutic index, drug-receptor interaction, model of drug-receptor interaction, pharmacodynamics, pharmacokinetics; mechanism of drug action, molecular modelling of drugs; introduction to combinatorial chemistry.

Sulpha drugs: Sulpha drugs (sulphonamide), mode of action and sulfa allergy.

Antibiotics: Introduction and classifications; structure-action relationship of different classes of antibiotics like, β -lactam antibiotics, aminoglycoside antibiotics, tetracyclines, chloramphenicol, macrolite and peptide antibiotics, tuberculosis and drug resistant bacteria.

Antimalarial: Malaria and life cycle of malaria parasites, structure-action relationship of quinine, chloroquine, artemisinin and its derivatives.

Antiviral and anti-cancer drugs: Antiviral drugs and their mode of action, anticancer drugs-taxol.

Text Books and References;

1. A. L. Lehninger, D. L. Nelson and M. N. Cox, "Principles of Biochemistry", CBS Publishers and Distributors Pvt. Ltd.
2. D. Voet and J. G. Voet, "Biochemistry", John Wiley.
3. R. Silvermann, "The Organic Chemistry of Drug Design and Drug Action", Academic Press.
4. V. Alagarsamy, "Textbook of Medicinal Chemistry", Elsevier Health Sciences, India
5. G. L. Patrick, "An Introduction to Medicinal Chemistry", Oxford University Press.