

Proteins

Protein isolation and purification techniques (salt precipitation, dialysis and chromatography). Criteria for homogeneity; Protein sequencing.

Enzymes

Enzymes: properties (enzyme activity & specific enzyme activity) and classification (IUB enzyme classification and nomenclature system).

Enzyme-substrate(ES) complex: concept of substrate binding sites and active sites, significance of activation energy and free energy. Factors affecting enzyme activity; Coenzymes (Pyridoxal phosphate, NAD⁺ & FAD⁺) & cofactors. Mechanism of enzyme catalysis (chymotrypsin & lysozyme).

Michaelis-Menten equation: derivation, significance of V_{max} , k_{cat} and K_m . Lineweaver- Burk Plot. Enzyme inhibition: competitive, non-competitive and uncompetitive. Regulation of enzyme activity allosteric regulation, covalent modification, zymogenicity and protein turnover.

Suggested Readings:

- Whitford D (2005) Proteins 1st edn. Wiley
Bell J. E. et al (1988) Proteins & Enzymes, Prentice hall
Williamson Mike (2011) How Proteins Work 1st edn. Garland Science
Palmer T (2007) Enzymes 2nd Edn. Ellis Horwood Ltd.
Price N C (2009) Exploring Proteins, Oxford University Press
Kessel Amit (2011) Introduction to Proteins 1st edn. CRC Press
Bohager Tom (2006) Enzymes: What Experts know? One World Press
Effront J (2008) Enzyme & their Application, Kessinger Pubn.
Nelson D L and Cox M M (2008) Lehninger's Principles of Biochemistry, Macmillan Pub.
Berg J M, John L, Stryer L (2012) Biochemistry 6th Edn., W H Freeman & Co. Ltd

PAPER Ⅲ
BIOCHEMISTRY PRACTICAL - III

MM 25

1. Separation of proteins by SDS-PAGE
2. Gel filtration chromatography using protein mixture or dye
3. Assay of urease/ amylase activity
4. Determination of K_m and V_{max} of urease/ amylase
5. Effect of temperature and substrate concentration on enzyme activity.

Suggested readings:

- Boyer R F (2009) Modern Experimental Biochemistry 3rd edn. , 5th Impression Pearson edn.
Sadasivam S and Manickam A (2005) Biochemical Methods,(Rev Edn.) New Age Int. Pub, New Delhi.
Jayaraman (2011) Laboratory Manual in Biochemistry, New Age Int. Pub.
Plummer D T (2008 reprint) An Introduction to Practicals in Biochemistry 3rd Edn., Tata McGraw- Hill
Sambrook J and Russel D W (2012) Molecular Cloning 4th edn., CSH Lab Press
Rao B S & Deshpande (2005) Experimental Biochemistry Students Companion I K International Pub
Damodaran G (2011) Practical Biochemistry, Pub Jaypee bros.
Nigam A & Ayyagiri A (2008) Lab Manual in Biochemistry, Immunology & Biotechnology, Tata McGraw Hill
Yadav V. K. et al (2012) Biochemistry & Biotechnology- A Lab Manual, Pointer Publns.