

BT 631: Protein Structure and Function

(3-0-0-6)

Prerequisites: Nil

Introduction to protein structure and function; amino acids: building blocks of proteins, peptide bonds, polypeptides and its conformation; structural elements of protein structure: primary, secondary, tertiary and quaternary structures; bonds stabilizing protein structure; structural motifs; methods of determining three-dimensional structures of protein: X-ray crystallography, nuclear magnetic resonance (NMR), cryo-electron microscopy; basic concepts in analyzing protein structures; protein structure database; structure and function of fibrous proteins: (keratins and collagens) and membrane proteins (ATPase family); structures and mechanisms of dehydrogenases and proteases; chemical modification of enzymes using affinity reagents and side-chain specific reagents.

Text Books/References

1. **Principles of Protein Structure**, G.E. Schulz and R.H. Schirmer, *Springer (1979)*, ISBN: 978-0387903347.
2. **Proteins: Structure and Molecular Properties**, Thomas E. Creighton, *W.H. Freeman (2nd Edition, 1992)*, ISBN: 978-0716770305.
3. **Introduction to Protein Structure**, Carl Branden and John Tooze, *Garland Science (2nd Edition, 1999)*, ISBN: 978-0815323051.
4. **Proteins and Enzymes**, JE Bell and ET Bell, *Prentice Hall College Div (1988)*, ISBN: 978-0137316472.
5. **Proteins: Structure and Function**, David Whitford, *John Wiley (2005)*, ISBN: 978-0471498940.
6. **Reviews and Articles.**