THEORY

Unit 1 Structure of Cell
   1.1 Plasma membrane: Structure and transport of small molecules
   1.2 Cell Wall: Eukaryotic cell wall
      Extra cellular matrix and cell matrix interactions
      Cell-Cell Interactions - adhesion junctions, tight junctions, gap junctions,
      and plasmodesmata (only structural aspects)
   1.3 Mitochondria, chloroplasts and peroxisomes
   1.4 Cytoskeleton: Structure and organization of actin filaments, association of actin filaments
      with plasma membrane, cell surface protrusions, intermediate filaments, microtubules

Unit 2 Nucleus
   2.1 Nuclear envelope, nuclear pore complex and nuclear lamina
   2.2 Chromatin – Molecular organization
   2.3 Nucleolus

Unit 3 Protein Sorting and Transport
   3.1 Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER,
      protein folding, processing and quality control in ER, smooth ER and lipid synthesis, export
      of proteins and lipids
   3.2 Golgi Apparatus – Organization, protein glycosylation, protein sorting and export from
      Golgi Apparatus
   3.3 Lysosomes

Unit 4 Cell Signalling
   4.1 Signalling molecules and their receptors
   4.2 Function of cell surface receptors
   4.3 Pathways of intra-cellular receptors – Cyclic AMP pathway, cyclic GMP and MAP kinase
      pathway
Unit 5 Cell Cycle, Cell Death and Cell Renewal

No. of lectures: 12

5.1 Eukaryotic cell cycle and its regulation
5.2 Development of cancer, causes and types
5.3 Programmed cell death
5.4 Stem cells
5.5 Embryonic stem cell, induced pleuripotent stem cells


PRACTICALS

MARKS: 50

1. To study structure of cell organelles through electron micrographs
2. Cytochemical staining of DNA – Feulgen
3. To demonstrate the presence of mitochondria in striated muscle cells/ cheek epithelial cell using vital stain Janus Green B
4. Study of polyploidy in Onion root tip by colchicine treatment
5. Identification and study of cancer cells by photomicrographs

SUGGESTED READING


ONLINE READING MATERIAL