

Cell Biology

Prokaryotes: Cell structure and components, structure of viruses (bacteriophages & TMV)

Eukaryotes : Cell structure and subcellular organelles; plants and animal cells- differences in structure and functions.

Methods for studying cells and organelles: Phase contrast; staining; freeze fracture technique.
Subcellular fractionation- centrifugation, differential and density gradient centrifugation.

Cytoskeleton: microtubules and microfilaments; Cell motility- ciliary and flagellar movement, bacterial taxis. Cell division (mitosis & meiosis): Cell cycle and its regulation; Introduction to Apoptosis and stem cells.

Physiology

Homeostasis, Digestion, absorption and transport of carbohydrates, lipid, proteins and nucleic acids.
Absorption and transport of minerals (Fe^{++} and Ca^{++}) and vitamins (C & D). Blood cells; hemoglobin, oxygen and carbon dioxide transport; regulation of respiration; blood clotting.

Formation of urine, regulation of water, electrolyte balance, role of hormones in its maintenance.
Action potential, impulse transmission, synaptic transmission, muscle protein, mechanism of muscle contraction (skeletal and smooth), biochemistry of vision.

General classification of hormones; receptors: intracellular & cell surface, second messengers. Hormones of the pituitary, thyroid and pancreas. Basic mode of steroid and protein/ peptide hormone action mechanisms.

Suggested readings:

Darnell J, Lodish H and Baltimore D (2008) Molecular Cell Biology 6th edn., W H Freeman and co.

Darnell J, Lodish H and Baltimore D (2012) Molecular Cell Biology 7th edn., W H Freeman and co.

Roberts K et al.(2002) Molecular Biology of Cell 4th edn., garland Science

Alberts et al. (2010) Essentials Cell Biology 3rd edn., Garland Science

Karp Gerald (2009) Molecular cell Biology 6th edn., Wiley Pubn.

Weaver R (2011) Molecular Biology 5th edn., McGraw Hill Sc.

Wilson K and Walker J (2002) Principles and Techniques of Practical Biochemistry 5th Edn. Cambridge Pbn.

Guyton A C & Hall (2010)Textbook of Medical Physiology 12th Edn., W B Saunders.

Barrett K E et. Al. (2009) Ganong's Review of Medical Physiology 23rd edn. LANGE Basic Science McGraw Hill Medical

Ganong W F (2003) Review of Medical Physiology 21st edn. Appleton & Lange USA

Bhagavan N V et. al. (2011)Essentials of Medical Biochemistry with Clinical cases 1st Edn., Acad. Press.

Physiology & Biochemistry in Modern Medicine (2012) by Books Group, General Books Pbn.

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BIOCHEMISTRY PRACTICAL - IV

MM 25

1. RBC and WBC count
2. Study of the stages of mitosis
3. Study of meiotic cell division
4. Sub-cellular fractionation of organelles

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.