

Microbiology

Classification of microorganisms: Types, general characteristics, criteria used in the classification of bacteria. Growth curve and use of selection media in bacterial cultivation. Role of microorganisms: in food spoilage, food-borne infections.

Microbial Genetics: transformation, conjugation, transduction and transfection; Plasmids.

Immunology

Concept of immunity: innate and adaptive immunity; Cells and Organs of the immune system; Immunoglobulins- structure and functions; classes of antibodies: Antigens- Nature of antigens; Antigen- antibody interactions; Immunogens; Haptens; Adjuvants.

Haemopoietic stem cells; clonal selection theory: Structure and functions of MHC molecules. Genetic basis of antibody diversity: Complement fixation: Hypersensitivity and allergy: Autoimmune diseases; monoclonal antibody and its application in biology. Vaccines.

Suggested readings:

- Presscott L M et al (2004) Microbiology 6th edn, McGraw Hill
- Nester E W (2003) Microbiology 4th edn. McGraw Hill
- Burton, Leboffe et al (2012) Photographic Atlas for Microbiology 4th edn. Morton Pbn.
- Willey J et al (2010) Presscott's Microbiology 8th edn. McGraw Hill
- Talaro K P (2011) Foundations in Microbiology 8th edn. McGraw Hill
- Brown A E (2011) Benson's Microbiological Application 12 edn. McGraw Hill
- Male D K (2006) Immunology 7th edn. Mosby Pubn.
- Thomas J et al (2006) Kuby Immunology 6th edn. W H Freeman
- Khanna Raj (2011) Immunology, Oxford University Press
- Alberts et al. (2010) Essentials Cell Biology 3rd edn., Garland Science
- Murphy (2012) Immunobiology 8th edn. Garland Science
- Kuby Immunology (2010) Goldsby R A et al, 6th edn. W H Freeman pbn.
- Roitt I M, Burton D R et al (2011) Essential Immunology 12th edn. Wiley Blackwell Pbn.

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BIOCHEMISTRY PRACTICAL - VII

MM 25

1. Isolation of microbes from water and soil using selective media.
2. Study of bacterial growth kinetics.
3. Effect of antibiotic on bacterial growth.
4. Determination of ABO blood groups and Rh factor
5. Determination of antigen- antibody specificity by immunodiffusion (ODD).

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
Farrell et al (2005) Experiments in Biochemistry: A Hands-on Approach 2nd Edn. Brooks Cole Pbn.
Rao B S & Deshpande (2005) Experimental Biochemistry Students Companion I K International Pub
Damodaran G K (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 Publins.
Bhargava/ Gupta (2010) Practical Biochemistry, CBS Publishers
Sawhney S K. (2005) Introductory Practical Biochemistry, Alpha Science International Ltd.
Divya Santhi (2010) An Easy Guide for Practical Biochemistry, Jaypee brothers & Medical Publn.

Nucleic acids as genetic material, experimental evidence (bacterial genetic transformations and Hershey-Chase Experiment); Salient features of viral, prokaryotic and eukaryotic genomes; Repetitive DNA sequences.

DNA replication in prokaryotes (semi conservative, semi-discontinuous & mechanism); inhibitors of DNA replication. Salient differences in eukaryotes.

Transcription in prokaryotes- Mechanism of transcription in prokaryotes; inhibitors of transcription; Regulatory RNA (miRNA & snRNA); Catalytic RNA: Salient differences in eukaryotes.

Basic features of the genetic code; Wobble hypothesis; Mechanism of prokaryotic translation; Salient differences in eukaryotes; signal sequences.

Regulation of gene expression in prokayotes; operon concept (*lac* operon and *trp* operon).

Molecular cloning : general approach; Application of recombinant DNA technology: PCR, RT-PCR and qPCR:

Introduction to bioinformatics: gene & protein databases.

Suggested Readings:-

- Pal J K et al (2011) Fundamentals of Molecular Biology. Oxford University Press
- Krebs J E et al (2011) Lewins Gene X. Jones & Bartlett Pbn.
- Weaver et al (2011) Molecular Biology 5th edn. McGraw Hill
- Alberts B et al (2008) Molecular Biology of the Cell 5th edn. Garland Science
- Watson J D et al (2007) Molecular Biology of the Gene 6th edn. Benjamin Cummins
- Karp et al (2009) Cell & Molecular Biology 6th edn. Wiley Pbn.
- Cox M M & O'Donnell (2011) Molecular Biology- Principle & Practice, W H Freeman

PAPER ~~XII~~ VIII
BIOCHEMISTRY PRACTICAL - VIII

MM 25

1. Isolation of DNA from animal/plant systems.
2. Agarose gel electrophoresis of DNA.
3. Measurement of Tm of DNA sample
4. Amplification of DNA using PCR technique.

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- 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
Farrell et al (2005) Experiments in Biochemistry: A Hands-on Approach 2nd Edn. Brooks Cole Pbn.
Rao B S & Deshpande (2005) Experimental Biochemistry Students Companion I K International Pub
Damodaran G K (2011) Practical Biochemistry, Pub Jaypee bros.
Nigam A & Ayyagiri A (2008) Lab Manual in Biochemistry, Immunology & Biotechnology, Tata McGraw Hill
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Bhargava/ Gupta (2010) Practical Biochemistry, CBS Publishers
Sawhney S K. (2005) Introductory Practical Biochemistry, Alpha Science International Ltd.
Divya Santhi (2010) An Easy Guide for Practical Biochemistry, Jaypee brothers & Medical Publn.