Subject Code : P8GT5

CORE COURSE V - MICROBIAL GENETICS

UNIT 1

Contribution by Louis Pateur and Koch – Comparison of Prokaryotic and Eukaryotic cells - Whittakar's Five kingdom concept. Ultrastructure of bacteria – cytoplasmic inclusions- nuclear material – Plasmid – types and significance. Bacteriological media – culture of microbes – streak plate and pour plate methods. Growth Rate and Growth cycle of bacteria – Structure and composition of virus – Caspid – Symmetry – Nucleic acids – Envelope – Viriods – Viral replication and replication cycle – cultivation of animals virus by chick embryo technique.

UNIT II

Pathogenic microbes in Air, Water, and Soil (Any 5 important pathogenic microbes and disease caused – list only). Microbes and polluted waters – coliform group- Bacteriological examination of water – test for coliform bacteria in water – bacteriological treatment of waste water – BOD. A brief study ,symptoms of disease, mode of transmission and control of pathogenic organism (*Treponema pallidum, Mycobacterium tuberculosis,* Polio virus and HIV only).Microbial Control – Moist heat sterilization, radiation, phenolic compounds, alcohol, Penicillin and Streptomycin.

UNIT III

Nucleic acid as genetic material – proofs, structure and types. DNA replication and repair – Prokaryotic and Eukaryotic genome – Human genome (outline only) with examples - C value paradox – Molecular basis of mutation – Fine structure of gene – Modern concept , Jumping genes – Transposons – Function of DNA.

UNIT IV

Gene regulation in prokaryotes and eukaryotes - Gene regulation and protein synthesis – Transcription and Translation signal – Inborn errors of metabolism – X,Y and autosomal inheritance – Genetic disorder – Gene therapy – DNA fingerprinting.

TEXT BOOKS:

1. Pelczar, M.J., Chan, E.C.S., and Kerign, N.R., 1986, Microbiology, McGraw Hill New York.
2. Strachan, 1999, Human Molecular Genetics, John Wiley and Sons, Singapore.

REFERENCE BOOKS:

1. Ananthanarayanan, R., and J ayaram Paniker, C.K., 1997, Text Book of Microbilogy, Orient Longman Ltd., New Delhi.
2. Davis, B.D., Dulbecco.R., lisen, H.N. and Ginsberg, H.S., 1986, Microbiology, Harper and Row, New York
3. Gardner, E.J. and Snustad, D.P., 1994, Principles of Genetics, John Wiley and Sons, New york
4. Gupta, P.K., 1997, Genetics, Rastogi publications, Meerut, India
5. Hart, D.L. and Jones E.W., 1998, Genetics – Principles and Analysis, Jones and Bartlett Publishers, London.
6. Klug, W.S. and Cummings, M.R., 1997, Concepts of Genetics, Pretice hall international Inc, USA.
7. Lewin, B., 2000. Genes VII. Oxford University Press Inc., New york.
8. Prescott, L.M., Harley, P.J. and Klein, D.A., 1996, Microbiology, WM>C. Brown Publishers, London.
9. Rai, A., 1985, Methods in cell culture and virology, Allied Publishers, New Delhi.
10. Smith, K.M. and Ritchie, D.N., 1980, Introduction to virology, Chapman and Hall, London.
11. Watson, J.D., 1997, Molecular Biology of gene, W.A. Benjamin Inc., London
12. Weaver, R.F. and Hedrick,P.W., 1997, Genetics, WM.C. Brown Publishers, London.