Subject Code : P8BCE3

ELECTIVE COURSE – III: GENETIC ENGINEERING

Unit1

Introduction to gene cloning: Early development of genetics – gene cloning – specialized tools and techniques – importance of gene cloning.
Intellectual Property Rights and types, patening. Isolation and purification of DNA: Preparation of total cell DNA, plasmid DNA, bacteriophage DNA, plant cell DNA

Unit 2

Cloning and expression vectors: Plasmids – bacteriophages (M_{13} and λ) pUC vectors yeast vectors, agrobacterium, medicated Gene transfer, YAC, BAC, Human artifical chromosomes, Ti plasmid, SV40, baculoviruses, adenoviruses, papilloma viruses and retroviruses.

Unit 3

Multipulatin of purified DNA: DNA manipulative enzymes – necleases, ligases, polymerases, topoisomerases, restriction enzymes – performing restriction digests, ligation – joining DNA molecules together – random labeling nick translatin and end filling.

Unit 4

Introduction of DNA into living cells: Biolistics, electroporation, microinjection, liposome-mediated method and calcium phosphate method.

Unit 5

Construction of libraries – studying gene and genome structure – blotting techniques, PCR, in situ hybridization, DNA sequencing, chromosome walking and jumping, DNA foot printing, HR and HART, Restriction analysis of DNA RELP, RADD – Principles, procedures and applications