

AMB15 RECOMBINANT DNA TECHNOLOGY

UNIT-1 BASIC CONCEPT

Basic concepts in genetic engineering

UNIT-2 TOOLS OF GENETIC ENGINEERING

Cloning vehicles, Restriction enzymes, Modifying enzymes, DNA ligase, Polymerase etc.

UNIT-3 CLONING VECTORS

Plasmids, Lambda phage, Phagemids, Cosmids, Artificial chromosomes (BACs, YACs), Shuttle vectors, virus based vectors.

UNIT-4 METHODS OF GENE TRANSFER

Transformation, transduction, Particle gun, Electroporation, liposome mediated, microinjection, Agrobacterium mediated gene transfer.

UNIT-5 PREPARATION AND APPLICATION OF MOLECULAR PROBES

DNA probes, RNA probes, Radioactive labeling, Non radioactive labeling, use of molecular probes, DNA fingerprinting.

UNIT-6 ANALYSIS AND EXPRESSION OF CLONED GENE IN HOST CELLS

Expression vectors, Restriction enzyme analysis, Southern blotting, Northern blotting, Western blotting, In-situ hybridization. Colony and plaque hybridization, Factors affecting expression of cloned genes, Reporter genes, Fusion proteins.

UNIT-7 GENE LIBRARIES

cDNA synthesis, Genomic DNA libraries, Amplification of gene libraries, identifying the products of cDNA clones.

UNIT-8 ISOLATION, SEQUENCING AND SYNTHESIS OF GENE

Different methods of gene isolation, Techniques of DNA sequencing, Artificial DNA synthesis.

UNIT-9 POLYMERASE CHAIN REACTION (PCR)

Basic principles, modifications, applications.

UNIT-10 MODIFYING GENES

Site-directed mutagenesis, Insertion & Deletion Mutagenesis.

Reference Books

1. From Genes to Clones by Winnacker. PANIMA
2. Molecular Biotechnology by Pasternack and Glick.
3. From Genes to Genomes: Concepts & Applications of DNA Technology by J.W. Dale & M.V. Schartz.