

Biotechnology
B.Sc- II Year, Semester – III
Core Course DSC-3

MOLECULAR BIOLOGY AND r-DNA TECHNOLOGY

UNIT-I

- 1.1. Transcription in prokaryotes: Enzymatic Synthesis of RNA, Basic features of RNA synthesis, E.coli RNA polymerase, Classes of RNA molecules.
- 1.2. Transcription mechanism in prokaryotes – Promoter, initiation, elongation, proof reading and Rho dependent and Rho independent termination.
- 1.3. Transcription in Eukaryotes : Polymerases of eukaryotes, Promoters of eukaryotes.
- 1.4. Synthesis of hn RNA and post transcriptional modifications
- 1.5. The Genetic Code, properties of genetic code, Wobble hypothesis.
- 1.6. Translation mechanism in prokaryotes and eukaryotes.

UNIT-II


- 2.1. Regulation in Prokaryotes: General aspects of Regulation.
- 2.2. Transcription level regulation – positive, negative regulation.
- 2.3. Auto and co-ordinated regulation.
- 2.4. Operon concept – lac, trp, operons.
- 2.5. Translation regulation in Eukaryotic and prokaryotic organism.
- 2.6. Inhibitors of Protein synthesis – antibiotics and other inhibitors.


UNIT-III

- 3.1. Enzymes used in gene cloning: Restriction Endonucleases, Ligases, Phosphatases, Methylases, Kinases.
- 3.2. Cloning vehicles, plasmids, cosmids, phage vectors.
- 3.3. Construction of genomic and cDNA libraries.
- 3.4. Identification of cloned genes – Colony hybridisation.
- 3.5. Expression vectors: Bacterial vectors.
- 3.6. Yeast vectors.

UNIT-IV

- 4.1. Principle, Methodology and application of PCR technology.
- 4.2. Variations of PCR.
- 4.3. DNA fingerprinting technique and its application in forensic medicine.
- 4.4. Principles involved in blotting techniques - Southern, Northern and Western.
- 4.5. Genome sequencing: Sanger model of sequencing.
- 4.6. Applications of r-DNA technology in medicine.




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