

AMBT08 MOLECULAR BIOLOGY

UNIT-1 STRUCTURE AND PROPERTIES OF NUCLEIC ACIDS

Models of DNA structure; RNA structure; Physical, Chemical, Spectroscopic Nuclear & Organelle genomes,

UNIT-2 GENOME COMPLEXITY

L C value paradox, cot analysis, Repetitive DNA, Satellite DNA, Pseudo genes, Synteny.

UNIT-3 CHROMOSOME ORGANIZATION

Histones, Non-histones, Nucleosome, Chromatin, Chromosome structure in prokaryotes & eukaryotes,

UNIT-4 GENE ORGANIZATION

Split Genes, Overlapping genes, Transposons & Retrotransposons, Gene clusters,

UNIT-5 DNA-PROTEIN INTERACTION

DNA- binding motifs, Methods of studying DNA- binding proteins,

UNIT-6 DNA REPLICATION

Models of DNA replication, Enzymology of DNA replication, The Replication process, Initiation, Elongation & Termination of replication; Telomeres.

UNIT-7 TRANSCRIPTION AND mRNA PROCESSING

Components of transcriptional machinery in prokaryotes and eukaryotes; Initiation, Elongation & Termination of transcription; Capping, Polyadenylation, Splicing, mRNA stability.

UNIT-8 TRANSLATION

The Genetic code; tRNA & aminoacyl synthetases, Ribosomes, Translation process, Initiation, Elongation & termination of transcription; Capping, Polyadenylation, Splicing, mRNA stability.

UNIT-9 REGULATION OF GENE EXPRESSION

General aspects of regulation prokaryotes & eukaryotes; The operon model, lac & trp operons; DNA methylation; Tissue-sp. & developmental stage sp. Expression of genes.

UNIT-10 GENE MUTATION

Somatic vs germinal mutation, Mutant types, Selective Systems, Induction of mutation, Chromosomal mutations, Changes in chromosome structure mutation and cancer, Mutagens in genetic dissection, Mutation breedings, Molecular basis of gene mutations, Repair defects and human diseases, Recombination, Transposable genetic elements.

UNIT-11 MOLECULAR EVOLUTION

DNA based phylogenetic trees and their applications.

Reference Books

1. Gene VII by B. Lewin.
2. Essentials of molecular Biology, Malacinski and Freifelder Jones and Bartlelt Publishers.
3. Genomes, T. A. Brown, John Wiley and Sons PTE Ltd.
4. Cell and molecular Biology, Concepts and experiments Gerald Karp, John Wiley and Sons.
5. The Cell - A molecular approach, Gm Cooper Asm Press.

