

Title Of Course – Explore DNA Fragments

Course Code: NPIAS-VAC-112

Course objective:

- It will enhance knowledge about DNA structure and its behavior in electric field.
- The course will help towards understanding of how DNA is useful biomolecules that help in diagnostic biology

Syllabi of Course:

Introduction:

8 Hrs.

History & Discovery, Structure of DNA and RNA, Nitrogenous base, Why DNA is so important, Junk DNA.

Information Pathway:

8 Hrs.

Central Dogma of Molecular Biology, DNA replication: Enzymes & Mechanism, DNA damage and repair, Transcription: Prokaryotic RNA polymerase, role of factor, promoter, initiation, elongation & termination of RNA chains, Regulation of prokaryotic gene expression (Operon model), Translation: Genetic code, Enzymes & Mechanism

Isolation of Nucleic Acid:

8 Hrs.

Cell membrane lysis buffer, Nuclear membrane lysis buffer, Solution & Buffer used during isolation of DNA. Different isolation methods: Kit methods, Phenol Chloroform Method, Salting out Methods

Molecular methods in clinical microbiology

8 Hrs.

NAAT, Applications of PCR, RFLP, Nuclear hybridization methods, Single nucleotide polymorphism and plasmid finger printing in clinical microbiology

DNA Electrophoresis:

8 Hrs.

Introduction, Principle, Instrumentation, Applications, Types of electrophoresis, Paper electrophoresis, Gel electrophoresis- Agarose, 2D-Gel Electrophoresis


Suggested Reading:

Nishiguchi, Michele K., Phaedra Doukakis, Mary Egan, David Kizirian, Aloysius Phillips, Lorenzo Prendini, Howard C. Rosenbaum et al. "DNA isolation procedures." (2002): 249-287.

Ghaheri, M., et al. "A comparative evaluation of four DNA extraction protocols from whole blood sample." *Cellular and Molecular Biology* 62.3 (2016): 120-124.


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