Isolation, characterisation and Quality Check of Genomic DNA

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Isolation, characterisation and Quality Check of Genomic DNA	**2**	**NIL**	**NIL**	**2**	**Class XII**	**NIL**

Learning Objectives:

Students of this course should be able to learn:

- Basics of Genomic DNA, need for isolation of genomic DNA and different methods for its isolation.
- Problems due to RNA contamination in further use of genomic DNA and Methods for elimination of contaminating RNA.
- Use of electrophoresis and spectrophotometric techniques for the quantification and quality check of DNA

Learning Outcomes:

At the end of this course, students should be able to learn and perform in Hands-on mode:

- Different methods for isolation of genomic DNA from prokaryotic and eukaryotic cells.
- Handle prokaryotic and eukaryotic cell samples.
- Isolate Genomic DNA and characterise by agarose gel electrophoresis
- Remove RNA contamination from genomic DNA
- Quantify and check quality of DNA by spectrophotometric technique.

Unit 1: Isolation of Genomic DNA from prokaryotic cell (24 hours)

Information on differences between eukaryotic and prokaryotic cells wrt lysis of cells and extraction of DNA, different methods used for isolation of genomic DNA; different kinds of samples as starting material for extraction of DNA.

Practical: Isolation of Genomic DNA

1.1 Composition and preparation of required reagents.

1.2 Isolation of genomic DNA from E. coli culture.

1.3. Gel electrophoresis for isolated genomic DNA

Unit 2: Isolation of Genomic DNA from eukaryotic cell (24 hours)

Different methods used for isolation of genomic DNA; different kinds of samples as starting material for extraction of DNA.

Practical: Isolation of Genomic DNA

2.1 Composition and preparation of required reagents.

2.2 Isolation of genomic DNA from Blood sample etc.

2.3. Gel electrophoresis for isolated genomic DNA

Unit 3: Elimination of RNA contamination followed by quantitation and quality check (16 hours)

Problems due to RNA contamination in further use of genomic DNA in different applications, various methods for removal of RNA from genomic DNA preparation, Gel electrophoresis and UV-visible spectrophotometry-based quantification and quality check of DNA. Other automated systems of quality check for nucleic acids.

Practical Session:

3.1 Removal of RNA from genomic DNA preparation

3.2 Gel electrophoresis of the genomic DNA preparation

3.3 Spectrophotometry-based quantification and quality check of DNA

Essential/ Recommended Readings:

1. Sambrook J, Fritsch EF & Maniatis T. Molecular Cloning. A laboratory Manual. 3rd Edition. Cold Spring Harbor Laboratory Press. New York.
2. Ausubel FM, Brent R, Kingston RE, Moore DD, Seidman JG, Smith JA, Struhl K. Current Protocols in Molecular Biology. (eds.) John Wiley & Sons, Inc. New York.

Suggestive Reading:

1. Alberts, B.,Bray, D, Lewis, J., et al. The Molecular Biology of the Cell. Garland Publishing, New York.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.