

# 236C31 Molecular Biology Practical Summary

## Course Units

### ***Unit 1: Provide Knowledge On Structure And Replication Of Dna***

- Study of different types of DNA and RNA using micrographs and model / schematic representations.
- Study of semi-conservative replication of DNA through micrographs / schematic representations.

### ***Unit 2: Elucidate The Methods Of Genomic And Plasmid Dna***

- Isolation of Genomic and Plasmid DNA from E. coli and Analysis by Agarose gel electrophoresis.
- Estimation of DNA using colorimeter (Diphenylamine reagent), UV spectrophotometer (A260 measurement).

### ***Unit 3: Methods Of Protein Separation***

- Resolution and visualization of proteins by polyacrylamide gel electrophoresis (SDS-PAGE) – Demonstration.
- UV induced auxotrophic mutant production and isolation of mutants by replica plating technique – Demonstration.

### ***Unit 4: Artificial Transformation Method***

- Perform artificial Transformation in E. coli.
- Isolation of antibiotic resistant mutants by gradient plate method.
- - Demonstration

### ***Unit 5: Outline The Role Of Phages In Genetics***

- Screening and isolation of phages from sewage.
- Isolation of RNA from yeast.
- Estimation of RNA using colorimeter (Orcinol)

## Course Outcomes

**CO1:** Illustrate different types of DNA and RNA.

**CO2:** Utilize hands-on training in isolation of genomic and plasmid DNA.

**CO3:** Analyze importance of experimental microbial genetics.

**CO4:** Apply the knowledge of molecular techniques in various fields.

**CO5:** Investigate the significance of Phages.

## **Text Books**

1. Crichton. M. (2014). Essentials of Biotechnology. Scientific International Pvt Ltd. New Delhi.
2. Sambrook J. and Russell D.W. (2001). Molecular Cloning - A Laboratory Manual – 7th Edition. Cold Spring Harbor, N.Y: Cold Spring Harbor Laboratory Press.
3. Dale J. W., Schantz M. V. and Plant N. (2012). From Gene to Genomes – Concepts and Applications of DNA Technology. (3rd Edition). John Wileys and Sons Ltd.
4. Gunasekaran P. (2007). Laboratory Manual in Microbiology. New Age International.
5. James G Cappucino. and Natalie Sherman. (2016). Microbiology – A laboratory manual. (5th Edition). The Benjamin publishing company. New York.

## **Reference Books**

1. Glick B. R. and Patten C.L. Molecular Biotechnology – Principles and Applications of Recombinant DNA. 5th Edition. ASM Press. 2018.
2. Russell P.J. (2010). iGenetics - A Molecular Approach, 3rd Edition., Pearson New International edn.
3. Nelson, D.L. and Cox, M.M. Lehninger(2017). Principles of Biochemistry. 7th
4. Synder L., Peters J. E., Henkin T.M. and Champness W. (2013). Molecular Genetics of Bacteria, 4th edition, ASM Press Washington-D.C. ASM Press.
5. Brown T.A. (2016). Gene Cloning and DNA Analysis. (7th Edition). John Wiley and Jones, Ltd.

## **Web Resources**

1. <https://www.molbiotools.com/usefullinks.html>
2. (PDF) Molecular Biology Laboratory manual (researchgate.net)
3. <https://www.molbiotools.com/usefullinks.html>
4. <https://geneticgenie.org3>.
5. <https://currentprotocols.onlinelibrary.wiley.com/doi/pdf/10.1002/cpet.5>