

**Shivaji College**  
**NAAC Accredited Grade “A”**  
**(University of Delhi)**

# **LABORATORY MANUAL**

## **2022**

**DBT STAR COLLEGE SCHEME**



Department  
of Biotechnology  
Govt. of India

## List of Contents

S. No.	Name of Experiment	Contributing Authors
<b>Department of Biochemistry</b>		
1.	Preparation of Haemin and Hemochromogen crystals	Prof. Darshan Malik & Dr. Renu Baweja
2.	To study the effect of soap, 70% ethanol and hand sanitizer (chemical methods of sterilization) on growth of bacteria	Dr. Renu Baweja & Dr. Usha Yadav
3.	Study of Genetic Variation in human populations and application of Hardy Weinberg Law: e.g., Tongue Rolling, widow's peak, attached ear lobe, finger placement etc	Dr. Jayita Thakur & Dr. Usha Yadav
4.	Separation of plasma proteins using SDS PAGE	Prof. Darshan Malik & Dr. Renu Baweja
5.	Immunoblotting	Dr. Usha Yadav
6.	Isolation of genomic DNA from blood	Prof. Rashmi Wardhan & Dr. Usha Yadav
7.	To determine the purity of DNA by UV Spectrophotometry	Dr. Usha Yadav
8.	Use of various resources on the National Centre for Biotechnology Information (NCBI)	Dr. Jayita Thakur and Dr. Usha Yadav
9.	Navigate UniProt to access high-quality resource of protein sequences and functional information	Dr. Jayita Thakur and Dr. Usha Yadav
10.	Utilize ProtParam for computation of various physical and chemical parameters for a given protein	Dr. Jayita Thakur and Dr. Usha Yadav
11.	Designing of primers for PCR using bioinformatics tools	Dr. Jayita Thakur and Dr. Usha Yadav
<b>Department of Botany</b>		
12.	Development of conducting strand in different groups of plants (algae, bryophytes, pteridophytes, gymnosperms and angiosperms)	Dr. Anuradha Mal, Dr. Anita Kapur, Dr. Seema Talwar, Dr. Divya Mohanty, Dr. Anurag Maurya, Dr. Devender Singh Meena
13.	Spectroscopic measurement of the total capsaicin content as an indicator of pungency in chilli powder	Dr. Smita Tripathi, Dr. Misha Yadav, Dr. Seema Talwar, Dr. Nupur Mondal, Dr. Anurag Maurya, Dr. Devender Singh Meena
14.	To understand Hardy-Weinberg's Law/ Population Genetics using PTC taster-non tasters test	Dr. Prabhavathi V, Dr. Kiran Bamel, Dr. Nupur Mondal, Dr. Divya Mohanty
15.	To study the stigma receptivity of different plants through stigma surface esterase activity in vitro	Dr. Anuradha Mal, Dr. Seema Talwar, Dr. Divya

		Mohanty, Dr. Devender Singh Meena
16.	Comparison of loss of water from two surfaces of leaf by $\text{CoCl}_2$ method	Prof. Pratima Rani Sardar, Dr. Kiran Bamel, Dr. Nupur Mondal, Dr. Anurag Maurya
17.	To ascertain percentage ovule receptivity of different plants and compute the seed to ovule ratio	Dr. Anuradha Mal, Dr. Seema Talwar, Dr. Divya Mohanty, Dr. Devender Singh Meena
18.	(A) To study the Classification of databases (B) To retrieve nucleotide sequence of a given gene from the GenBank, National Centre for Biotechnology Information Database	Dr. Anuradha Mal, Dr. Nupur Mondal, Dr. Divya Mohanty
19.	To perform gene annotation using ORF finder	Dr. Anuradha Mal, Dr. Divya Mohanty, Dr. Nupur Mondal
<b>Department of Chemistry</b>		
20.	Comparative study of presence of Na, Ca, K in cold drinks and coconut water using flame photometric techniques	Dr. Anil K. Aggarwal, Dr. Rahul Singhal, Dr. Vandana Katoch and Dr. Priyanka Kumari
21.	Separation of anions by Dowex 21K exchange resin	Dr. Vandana Katoch, Dr. Sunil Yadav, Dr. Priyanka Kumari and Dr. Pallavi Agarwal
22.	To synthesize dibenzalacetone by Claisen-Schmidt condensation	Dr. Bhaskar Mohan Kandpal, Dr. Neena Khanna and Dr. Parveen Gahlyan
23.	To perform a rearrangement reaction of benzil into benzilic acid	Dr. Nand Gopal Giri, Mr. Deepesh Singh, Dr. Pooja Saluja and Dr. Parveen Gahlyan
24.	To estimate the concentration of Calcium ions in the commercially available supplement tablets complexometrically by using EDTA as a complexing agent	Mr. Mahendra Kr. Meena, Dr. Richa Arora and Dr. Shilpa Jain
25.	Complexometric estimation of $\text{Al}^{3+}$ using Eriochrome black-T as indicator	Dr. P.K. Sahu, Mr. Narinder Kumar and Dr. Pallavi Agarwal
26.	To estimate Vitamin C in different brands of packed juices	Dr. Rajni Kanojia, Mr. Deepesh Singh, and Dr. Pooja Saluja
27.	To separate of a mixture of o- and p-nitrophenol using Thin Layer Chromatography (TLC)	Mr. Deepesh Singh & Dr. Pooja Saluja
28.	Estimation of Cholesterol by Lieberman Burchard Reaction	Mr. Deepesh Singh & Dr. Pooja Saluja
29.	To carry out preparation of nail polish	Mr. Deepesh Singh & Dr. Pooja Saluja

30.	To construct the standard curve of the maltose using 3,5-dinitro salicylic acid (DNSA) method and determine the activity of $\alpha$ -amylase.	Mr. Deepesh Singh & Dr. Pooja Saluja
<b>Department of Zoology</b>		
31.	To perform Polymerase Chain Reaction (PCR)	Dr. Deepika Yadav, Dr. Aeshna Nigam & Dr. Ankita Dua
32.	To screen for a desired genetic construct by using Colony PCR	Dr. Deepika Yadav, Dr. Aeshna Nigam & Dr. Ankita Dua
33.	To amplify 16S rRNA gene by using Polymerase Chain Reaction	Dr. Deepika Yadav, Dr. Aeshna Nigam & Dr. Ankita Dua
34.	To design primers for a PCR reaction using NCBI Primer-BLAST	Dr. Deepika Yadav, Dr. Aeshna Nigam & Dr. Ankita Dua
35.	A Cost-effective & efficient egg windowing method to study early embryonic development in chick ( <i>Gallus gallus domestics</i> )	Ms. Nimita Kant
36.	Probabilistic modelling of sex ratio in human population based on the differential distribution of sex-chromosomes (X and Y)	Ms. Nimita Kant & Dr. Jitendra Kumar Chaudhary
37.	Quantitative estimation of a given antigen by using sandwich ELISA	Dr. Rakesh Roshan & Dr. Deepika Yadav
38.	Quantitative estimation of a given antigen by using indirect ELISA	Dr. Rakesh Roshan & Dr. Deepika Yadav
39.	To demonstrate the Dot ELISA technique in identification of antigen	Dr. Rakesh Roshan & Dr. Deepika Yadav
40.	To learn in silico ligand based drug design using Bioinformatics software tools	Dr. Neetu Singh
41.	To study polyploidy in Onion root tip by Colchicine Treatment	Dr. Tarun Kumar Vats & Dr. Deepika Yadav