



Deen Dayal Upadhyaya College (University of Delhi)

Department of Zoology under the aegis of

DBT Star College Scheme

Organized Five Days Hands on Workshop on

“BASIC PRINCIPLES OF RECOMBINANT DNA TECHNOLOGY & METAGENOMICS”

(28th August-1st September, 2018)



Convenors: *Dr. Shailly Anand & Dr. Renu Solanki*

DBT Convenor, Department of Zoology: *Dr. Sudhir Verma*

Resource Persons (External): *Dr. Utkarsh Sood & Dr. Vipin Gupta*

Resource Persons (Internal): *Dr. Anita Gulati, Dr. Lathika Nair, Dr. Renu Solanki, Dr. Shailly Anand, Dr. Sudhir Verma, Dr. Kamlesh Kumari, Dr. Rashmi Kumari, Dr. Princy Hira, Dr. Priya Singh & Dr. Satyam Dwivedi*

Supporting Staff: *Mr. Ravinder Tiwari, Mr. Krishanveer, Mr. Dayakishan & Mr. Lalit Giri*

A five days hands on inter-college workshop on “Basic Principles of Recombinant DNA Technology & Metagenomics” was organized by Department of Zoology under the aegis of DBT Star College Program from August 28 to September 1, 2018 in Laboratory No. 206 for undergraduate life science students of final year. The workshop was attended by following 31 students of B.Sc (Hons.) Zoology and B.Sc (P) Life Sciences from different colleges.

S. No.	Name of the Student	Course	Semester	College/ Institution
1.	Kartikeya	B.Sc (Hons.) Zoology	V	DDUC
2.	Aryaditi Jena	B.Sc (Hons.) Zoology	V	DDUC
3.	Devyani Sharma	B.Sc (Hons.) Zoology	V	DDUC
4.	Abhay verma	B.Sc (Hons.) Zoology	V	DDUC
5.	Sneha Bisht	B.Sc (Hons.) Zoology	V	DDUC
6.	Sapna Mishra	B.Sc (P) Life Science	V	DDUC
7.	Ojaswita Toppo	B.Sc (Hons.) Zoology	V	DDUC
8.	Rupali Thakur	B.Sc (Hons.) Zoology	V	DDUC
9.	Manjula	B.Sc (Hons.) Zoology	V	DDUC
10.	Mohini Thakur	B.Sc (Hons.) Zoology	V	DDUC
11.	G. Deepak	B.Sc (P) Life Science	V	DDUC
12.	Nisha Yadav	B.Sc (Hons.) Zoology	V	DDUC
13.	Pinku	B.Sc (Hons.) Zoology	V	DDUC
14.	Pooja Yadav	B.Sc (Hons.) Zoology	V	DDUC
15.	Meenakshi	B.Sc (Hons.) Zoology	V	DDUC
16.	Ekta	B.Sc (Hons.) Zoology	V	DDUC
17.	Samridhi Khandelwal	B.Sc (Hons.) Zoology	V	DDUC
18.	Rupesh Sharma	B.Sc (P) Life Science	V	DDUC
19.	Nidhi Maurya	B.Sc (P) Life Science	V	DDUC
20.	Kartikey Gaur	B.Sc (P) Life Science	V	DDUC
21.	Neha Soni	B.Sc (P) Life Science	V	DDUC

22.	Kritika Singh	B.Sc (Hons.) Zoology	V	Gargi College
23.	Priya Ahuja	B.Sc (Hons.) Zoology	V	Gargi College
24.	Mandavi Raji Sarraf	B.Sc (P) Life Science	V	Gargi College
25.	Mansi Kumar	B.Sc. (P) Life Sciences	V	Sri Venkateswara College
26.	Isha sachdev	B.Sc. (P) Life Sciences	V	Sri Venkateswara College
27.	Aditi Goel	B.Sc. (P) Life Sciences	V	Sri Venkateswara College
28.	Purvy garg	B.Sc. (P) Life Sciences	V	Sri Venkateshwara college
29.	Vrinda Khanna	B.Sc. (P) Life Sciences	V	Sri Venkateswara College
30.	Sara Dua	B.Sc (P) Life Sciences	V	Gargi College
31.	Aishwarya Arora	B.Sc (P) Life Sciences	V	Sri Venkateswara College

The workshop commenced with a brief introduction of all the resource persons and an outline of the workshop by Dr. Shailly Anand followed by a talk by Dr. Sudhir Verma showcasing the various activities organized by Dept. of Zoology under the aegis of DBT Star College Program and our goals underlying them.

The following experiments were conducted during the five days of the workshop:

- **Experiment 1:** Isolation of vector DNA (Mini Prep)
- **Experiment 2:** Visualization of DNA using agarose gel electrophoresis
- **Experiment 3:** Isolation of Metagenomic DNA from soil & its visualization on agarose gel
- **Experiment 4:** Restriction Digestion of vector DNA & lambda DNA using *EcoRI*, *HindIII* and *EcoRI/HindIII*
- **Experiment 5:** Heat Inactivation of Restriction Digestion
- **Experiment 6:** Elution of vector and lambda DNA from agarose gel
- **Experiment 7:** Ligation of vector and lambda DNA using T4 DNA Ligase – Creation of a Recombinant DNA
- **Experiment 8:** Transformation of *E. coli* cells with Recombinant DNA using Heat shock method
- **Experiment 9:** Selection of transformed *E. coli* cells using blue-white selection method
- **Experiment 10:** Calculation of Transformation Efficiency

To bridge the gap between the theoretical concepts & practical aspects, the workshop was planned in a manner to incorporate lecture sessions on the following topics:

- ✓ **Lecture 1:** Basic principle underlying the process of DNA isolation
- ✓ **Lecture 2:** An Introduction to Restriction Enzymes and Restriction Digestion as techniques of Gene Manipulation
- ✓ **Lecture 3:** The Concept of Restriction maps using Problem Based Learning (PBL) pedagogy
- ✓ **Lecture 4:** An Introduction to Ligation as a technique of Gene Manipulation
- ✓ **Lecture 5:** An overview of various Transformation Techniques and Selection Strategies used in Biotechnology

On request of students, a session on **media preparation and sterilization** was also incorporated during the workshop.

Students were provided with a manual of “**Stepwise Guide to Experiments**” (**Annexure I**) in which they recorded all the observations. Enclosed with this report is a copy of the student workbook (**Annexure II**) showing the details of the experiments and observations documented by the students during the workshop.

On Day 4 (31st August, 2018), **Prof. Rup Lal** from Molecular Biology Laboratory, Department of Zoology, University of Delhi also visited to interact with the students. He delivered a talk on “**Microbiome: The Vision for Future**” at 11:30 a.m. in Room No. 509. The lecture was attended by nearly 110 students of B. Sc (Hons.) Zoology & B. Sc (P) Life Sciences and 12 faculty members in addition to the participants of the workshop.

Attendance was recorded during morning and afternoon sessions on all the five days strictly (**Annexure III**).

The workshop concluded with a vote of thanks by Dr. Shailly Anand & Dr. Renu Solanki (Convenors, Workshop) and a feedback from all the participants (**Annexure IV**). The students also shared their experience during the five days and wished to participate in many more such workshops in future too. As commented by the students, the workshop was well organized, informative and helped them enhance their skill. The efforts of all the resource persons was appreciated by the participants.

Enclosures: Annexure I, II, III & IV

Photographic glimpse of the experiments and lectures held during the workshop

Dr. Princy Hira explaining the principle underlying agarose gel electrophoresis and the set up to the participants (DAY 1: 28th August, 2018)



Dr. Lathika Nair & Dr. Satyam Dwivedi delivering a lecture on Restriction Enzymes and their significance in Biotechnology (DAY 1: 28th August, 2018)

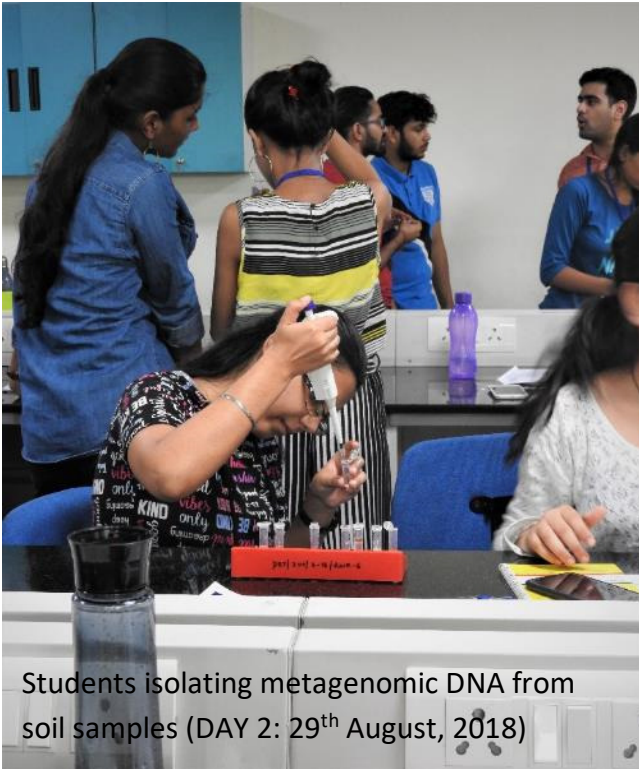


Dr. Utkarsh Sood talking on metagenomics and recent developments in the field (DAY 2: 29th August, 2018)



Dr. Vipin Gupta interacting with students and talking on metagenomics and recent developments in this field (DAY 2: 29th August, 2018)





Students isolating metagenomic DNA from soil samples (DAY 2: 29th August, 2018)



Dr. Utkarsh Sood & Dr. Vipin Gupta (Resource persons) preparing samples for the students (DAY 3: 30th August, 2018)



Dr. Princy Hira's session on the concept of DNA Ligation (DAY 3: 30th August, 2018)

Dr. Anita Gulati and Dr. Sudhir Verma's interactive session on construction of restriction maps using Problem Based Learning pedagogy (DAY 3: 30th August, 2018)



Prof. Rup Lal's lecture on "Microbiome: Vision for the Future" {DAY 4: 31st August, 2018}



Successful end with happiness of the students {DAY 5: 1st September, 2018}

