

# **WORKSHOP REPORT TECHNIQUES FOR MANIPULATION OF NUCLEIC ACIDS FOR APPLICATIONS IN GENOMICS**

**ORGANISED BY**

**DBT Supported Genomic Facility  
Centre for Innovation in Infectious Disease Research,  
Education and Training (CIIDRET)  
University of Delhi South Campus  
And  
Delhi School of Skill Enhancement and  
Entrepreneurship Development (DSSEED-IoE)**



**March 11-21, 2022**

**VENUE: UNIVERSITY OF DELHI SOUTH CAMPUS**

**FUNDED BY  
DEPARTMENT OF BIOTECHNOLOGY, GOVT. OF INDIA**





*Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)*

*and*

*Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IOE)*

## *Workshop Notice*

### **Techniques for manipulation of Nucleic acids for applications in genomics**

**11 March – 21 March 2022,  
University of Delhi South Campus**

The coursework will include classroom lectures and hands-on exercises on various techniques for manipulation of nucleic acids. This workshop will provide hands-on exposure to methods for isolation and nucleic acid manipulation techniques for genomics. These techniques are inter-disciplinary in nature and are required in almost all areas of research.

#### **Content:**

- Introduction to the workshop and Nucleic acid isolation technology.
- Methods for DNA isolation, Hands-on isolation of Plasmid DNA by different methods.
- Agarose gel electrophoresis of DNA.
- Quantitation and storage of isolated DNA.
- Automated DNA sequencing using Sanger method and analysis of data.
- Questionnaire and submission of workshop report.

**No. of seats- 20 students (First come first serve basis)**

**Venue: University of Delhi South Campus, New Delhi**

**Timing: 9:30 - 5:30 pm**

**Workshop Fee: There is a workshop fee of Rs. 2000 per person. This amount will be fully refunded and certificate will be issued to only those participants who successfully attend and complete the full duration of the course.**

#### **How to Apply:**

**Submit the registration form <https://forms.gle/YM26iYBmQ5roRY4w8>**

**LAST DATE for Application: 10 March 2022**

***DBT-supported Genomics Facility at CIIDRET, University of Delhi South Campus***  
**[udscmac@south.du.ac.in](mailto:udscmac@south.du.ac.in), [udscdnaseq@gmail.com](mailto:udscdnaseq@gmail.com); 011-24117542**

# COURSE SCHEDULE

DATE	BATCH 1	BATCH 2
<b>11<sup>th</sup> March (Friday)</b>	Introduction to the workshop Introduction of faculty & participants Introduction to all the equipment Practice of Pipetting Nucleic acid isolation technology- Principles & Methods	
	Demonstration of inoculation for isolation of plasmid DNA	Demonstration of inoculation for isolation of plasmid DNA
<b>12<sup>th</sup> March (Saturday)</b>	Demonstration of isolation of plasmid DNA by Spin Column Method	Demonstration of isolation of plasmid DNA by Spin Column Method
	Demonstration of isolation of plasmid DNA by PEG precipitation and analysis by agarose gel electrophoresis	Demonstration of isolation of plasmid DNA by PEG precipitation and analysis by agarose gel electrophoresis
<b>13<sup>th</sup> March (Sunday; 2 pm)</b>		
	Hands-on inoculation for isolation of Plasmid DNA	Hands-on inoculation for isolation of Plasmid DNA
<b>14<sup>th</sup> March (Monday)</b>	Hands-on Isolation of plasmid DNA by PEG precipitation method and analysis by agarose gel electrophoresis	Hands-on Isolation of plasmid DNA by Spin Column Method and analysis by agarose gel electrophoresis
	Hands-on Inoculation for isolation of plasmid DNA	Hands-on Inoculation for isolation of plasmid DNA
<b>15<sup>th</sup> March (Tuesday)</b>	Hands-on Isolation of plasmid DNA by Spin Column Method and analysis by agarose gel electrophoresis	Hands-on Isolation of plasmid DNA by PEG precipitation method and analysis by agarose gel electrophoresis
<b>16<sup>th</sup> March (Wednesday)</b>	Observation of isolated DNA samples on agarose gel and compilation of results	
	Streaking of bacterial culture	
	Demonstration of the technique for checking the quality of DNA by Nanodrop	
<b>17<sup>th</sup> March (Thursday)</b>	DNA Sequencing- Principles & Methods	
	Sequencing of isolated plasmid DNA (setting up of reaction)	
	Processing of samples for automated DNA sequencing	
<b>19<sup>th</sup> March (Saturday)</b>	Discussion/Queries and analysis of sequencing data	
	Compilation of all lab work and result	
<b>21<sup>st</sup> March (Monday)</b>	Answering Questionnaire on workshop experiments. Submission of workshop report.	
	Valedictory Function	

## LIST OF PARTICIPANTS

S. No	Full Name	Institution /College
1.	Aakanksha Choudhary	Institute of Home economics
2.	Arya Kirone Patra	Ram Lal Anand College
3.	Himani Sareen	Shaheed Rajguru College of applied sciences
4.	Beauty Kumari	Hindu College
5.	Bhoomika Arora	Jamia Millia Islamia
6.	Anjali Roy	Bhaskaracharya college of applied sciences
7.	Madhav Gaur	Hans Raj College
8.	Nancy	Bhaskaracharya college of applied sciences
9.	Nandini S Nair	Daulat Ram College
10.	Poorvi Tangri	Jamia Millia Islamia
11.	Shelja Agarwal	Ram Lal Anand College
12.	Shivapriya N Thilakan	Institute of Home Economics
13.	Sikander Pratap Singh	Shivaji College
14.	Simra Khan	Shaheed Rajguru College of applied sciences
15.	Sonail Karmakar	Bhaskaracharya College of Applied Sciences
16.	Sudhanshu Shukla	Shivaji College
17.	Vaishnavi Singh	Daulat ram college
18.	Varun Bhardwaj	Sharda University
19.	Khushi Jain	Central university of Punjab
20.	Aehsaas Roy	Shaheed Rajguru College of Applied Sciences

A hands-on training workshop for undergraduate and graduate students was organized at CIIDRET, UDSC from 11<sup>th</sup> – 21<sup>st</sup> March 2022. The theme of the workshop was “Techniques for Manipulation of Nucleic Acids for Applications in Genomics”. The workshop was funded by Department of Biotechnology, Govt. of India. The workshop included classroom lectures and hands on training modules. Various theoretical aspects covering plasmids, their features, different methods of isolation and purification of plasmid DNA and genomic DNA were discussed by Professor Amita Gupta, Professor Vijay Chaudhary explained the theory of DNA sequencing and data analysis.

The hands-on practical training was conducted in a manner that every student performed each and every step of each experiment independently. For this, the 20 participants were divided into 4 batches with 4 instructors. The batches were swapped after completion of one module so that they could benefit from the methodologies of the different instructors and learn all the skills in a systematic manner. All the participants were able to achieve the goals of the workshop. Their enthusiasm and interest was apparent from their 100% attendance on all days, presence throughout the long working hours, constant interactions and zeal to know more, making videos of the processes with their mobile phones and their desire to continue working at CIIDRET beyond the duration of the workshop. Even the refreshment break was enjoyed by them with snacks as per their desire. In fact, they expressed the desire to attend more workshops on several topics to master the skills for becoming good researchers.

The valedictory function had Prof. Balaram Pani, Dean of Colleges of University of Delhi telling them about his scientific journey. Over lunch and subsequent photo session, it was clearly evident that all the participants had thoroughly enjoyed their entire duration of the workshop.



**Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022**

**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: Khushi Jain , khushijain1234@gmail.com ,  
8375937910 .

Course-Subject, Year of study, College/University: MSc. Microbiology , completed ,  
Central university of punjab .

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |           |
|--|-----------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 ⑤ |
| 2. The content is relevant to my work.                                 | 1 2 3 4 ⑤ |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 ⑤ |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 ④ 5 |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 ⑤ |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 ④ 5 |
| 7. The instructors were good.  | 1 2 3 ④ 5 |
| 8. The instructors were helpful.                                       | 1 2 3 ④ 5 |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 ⑤ |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 ⑤ |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 ⑤ |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No  |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No  |

**14. Comments about the workshop:**

Workshop was well planned and organised. It utilized time of every participant and helped me in getting skill with basic experiments carried out in everyday life sciences lab. It was really helpful. I got skilled in performing pipetting, DNA isolation and extract<sup>n</sup> with accuracy.

**15. Other topics on which you would like to attend a workshop:**

Protein purifications and identification, experiments of Recombinant DNA Technology such as Cloning, selection etc. and cell culture techniques such as growing cell lines, preservation etc.

Signature

Date: 18, March, 2022 .

Your feedback is sincerely appreciated. Thank you.



Workshop on  
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University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: SHIVAPRIYA N THILAKAN,  
shivapriyathilakan@gmail.com, 7736226650

Course-Subject, Year of study, College/University: BIOCHEMISTRY, 2020-2023,  
INSTITUTE OF HOME ECONOMICS DELHI UNIVERSITY

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |           |
|--|-----------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 5 |
| 2. The content is relevant to my work.                                 | 1 2 3 4 5 |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 5 |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 5 |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 5 |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 5 |
| 7. The instructors were good.  | 1 2 3 4 5 |
| 8. The instructors were helpful.                                       | 1 2 3 4 5 |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 5 |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 5 |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 5 |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No  |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No  |

14. Comments about the workshop:

This workshop was a very good platform for students like me to  
learn and get a practical experience on course related  
topics like genomics to get a better understanding and  
visualize the concepts of the subject.

15. Other topics on which you would like to attend a workshop:

I would like to further attend workshops on biotechnology,  
biochemistry and genetics

Signature  Date: 18-3-2022

Your feedback is sincerely appreciated. Thank you.



Workshop on  
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University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: Simra Khan  
email id: mail.simra@gmail.com ph no: 9990055458

Course-Subject, Year of study, College/University: Bsc (H) Biomedical Sciences, 3<sup>rd</sup> Year.  
College: Shaheed Rajguru College of Applied Sciences for women, University of Delhi

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop facilities were suitable and appropriate 1 2 3 4 5
2. The content is relevant to my work. 1 2 3 4 5
3. The workshop activities stimulated my learning. 1 2 3 4 5
4. The activities in this workshop gave me good practice. 1 2 3 4 5
5. The teaching level of this workshop was appropriate. 1 2 3 4 5
6. The pace of this workshop was appropriate. 1 2 3 4 5
7. The instructors were good. 1 2 3 4 5
8. The instructors were helpful. 1 2 3 4 5
9. I accomplished the objectives of this workshop. 1 2 3 4 5
10. I will be able to use what I learned in this workshop. 1 2 3 4 5
11. The workshop was a good way for me to learn this content. 1 2 3 4 5
12. Would you recommend this workshop to a colleague? Yes / No
13. I would like to participate in other hands-on workshops organized. Yes / No

14. Comments about the workshop:

The workshop was very good and was very helpful to me.  
Teachers were supportive. It was well organised. I  
learnt a lot from this workshop.

15. Other topics on which you would like to attend a workshop:

I would be highly interested in attending a workshop on cloning,  
gene expression, human genome, tissue culture, PCR.

Signature

Simra Khan

Date:

19/03/22

Your feedback is sincerely appreciated. Thank you.



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University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: Aakanksha choudhary, aakankshachoudhary133@gmail.com, 8929641450

Course-Subject, Year of study, College/University: Biochemistry (hons), 2<sup>nd</sup> year, Institute of Home Economics, Hauz Khas, Delhi University

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

**14. Comments about the workshop:**

Very well organised with excellent trainers and relevant content. Sufficient hands-on practice of various wet lab skills as well as analysis of sequencing data.

**15. Other topics on which you would like to attend a workshop:**

Bioinformatics, immunology, Protein purification

Signature Aakanksha Date: 19/3/22

Your feedback is sincerely appreciated. Thank you.



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University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: Anjali Roy, anjaliray8178@gmail.com,  
8178507263

Course-Subject, Year of study, College/University: BSc(H), Microbiology, III<sup>rd</sup> Year,  
Bhaskaracharya College of Applied Sciences, University of Delhi

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

14. Comments about the workshop:

One of the best workshop I have ever joined for hands-on  
training. It gives students the opportunity to enhance & boost  
their skills. The environment of the workshop is very good and  
it is well equipped with modern machines and instruments.

15. Other topics on which you would like to attend a workshop:

Molecular biology techniques like SDS-PAGE, Southern blotting, Protein  
Purification etc.

Signature

Anjali Roy

Date:

19/03/2022

Your feedback is sincerely appreciated. Thank you.



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**University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: POORVI TANGRI poorvi.tangri2@gmail.com  
9315006972

Course-Subject, Year of study, College/University: M.Sc. Biochemistry  
Jamia Millia Islamia, Department of Biosciences

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 <u>4</u> 5 |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 <u>4</u> 5 |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | <u>Yes</u> / No  |
| 13. I would like to participate in other hands-on workshops organized. | <u>Yes</u> / No  |

14. Comments about the workshop:

Overall it was a very enriching experience. I got to learn a lot about the experimental details of DNA isolation & sequencing of the same.

15. Other topics on which you would like to attend a workshop:

Protein purification, cell culture, animal model handling.

Signature Poorvi Tangri

Date: 19/03/22.

Your feedback is sincerely appreciated. Thank you.



**Workshop on**  
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**University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: ARYA KIRONE PATRA, patra00arya@gmail.com  
+91-9667294357

Course-Subject, Year of study, College/University: Microbiology (H), 3<sup>rd</sup> year,  
Ram Lal Anand college, University of Delhi

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 <u>4</u> 5 |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 <u>4</u> 5 |
| 6. The pace of this workshop was appropriate.                          | 1 2 <u>3</u> 4 5 |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 <u>4</u> 5 |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 <u>4</u> 5 |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 <u>4</u> 5 |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | <u>Yes</u> / No  |
| 13. I would like to participate in other hands-on workshops organized. | <u>Yes</u> / No  |

14. Comments about the workshop:

State-of art devices with modern techniques were blissfully  
taught with fairly open and viable approach. Instructors  
rich in knowledge ready to serve your curiosity.

15. Other topics on which you would like to attend a workshop:

Protein isolation and sequencing / genome editing techniques

Signature Ayalekh Date: 18 March 2022

Your feedback is sincerely appreciated. Thank you.



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**and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)**  
**University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: NANDINI S. NAIR, spiritbae711@gmail.com  
+91 7838886795

Course-Subject, Year of study, College/University: B.Sc BIOCHEMISTRY (HONS.), 1<sup>st</sup> Year,  
DAULAT RAM COLLEGE, DELHI UNIVERSITY

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
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| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

**14. Comments about the workshop:**

This is the first time I attended a workshop & was in awe how great it is to learn everything practically. Theory was also taken but it was the hands-on practice of techniques that will always help me. To mention the instructors they were quite talented & knew their work & helped us in each step.  
Thank you for conducting this workshop! Hope to see you all again!

**15. Other topics on which you would like to attend a workshop:**

There are a list of topics on which I would like to attend a workshop. But the most interested ones are toxicology & forensic sciences techniques.

Signature Nandini S. Nair

Date: 19<sup>th</sup> March 2022

Your feedback is sincerely appreciated. Thank you.



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University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: SHELJA AGARWAL  
sheenaagarwal742@gmail.com 8827041371

Course-Subject, Year of study, College/University: B.Sc.(H) Microbiology (11 year)  
Ram Lal Anand College, University of Delhi

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 <u>4</u> 5 |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

14. Comments about the workshop:

The Hands on Workshop on Techniques for manipulation of Nucleic acids for applications in Genomics was a very worth workshop for me. It has included all the topics in the curriculum & had given the hands on experience for the same as well.

15. Other topics on which you would like to attend a workshop:

High Performance Liquid Chromatography (HPLC) & related topics.

Signature Sheela Agarwal Date: 18-March-22

Your feedback is sincerely appreciated. Thank you.



Workshop on  
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and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: Madhav Gaur gaurmadhav033@gmail.com  
(+91)8449771944

Course-Subject, Year of study, College/University: B.Sc. life Science, III<sup>rd</sup> year,  
Hansraj College/ Delhi University

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop facilities were suitable and appropriate 1 2 3 4 5
2. The content is relevant to my work. 1 2 3 4 5
3. The workshop activities stimulated my learning. 1 2 3 4 5
4. The activities in this workshop gave me good practice. 1 2 3 4 5
5. The teaching level of this workshop was appropriate. 1 2 3 4 5
6. The pace of this workshop was appropriate. 1 2 3 4 5
7. The instructors were good. 1 2 3 4 5
8. The instructors were helpful. 1 2 3 4 5
9. I accomplished the objectives of this workshop. 1 2 3 4 5
10. I will be able to use what I learned in this workshop. 1 2 3 4 5
11. The workshop was a good way for me to learn this content. 1 2 3 4 5
12. Would you recommend this workshop to a colleague? Yes / No
13. I would like to participate in other hands-on workshops organized. Yes / No

14. Comments about the workshop:

The workshop was carried out in a very neat and proper method, ensuring smooth workflow and dissemination of lectures. The apparatus provided was state-of-the-art as were the lab facilities. The instructors led the demonstrations very nicely in a student-friendly manner.

15. Other topics on which you would like to attend a workshop:

Protein isolation & purification, ELISA, Mass Spectroscopy,  
and techniques in immunology.

Signature [Signature] Date: 18/03/2022

Your feedback is sincerely appreciated. Thank you.



Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022

Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: AEHSAAS ROY, aehsaasroy@gmail.com,  
8240824408

Course-Subject, Year of study, College/University: B.Sc. (Hons.) Biomedical Sciences,  
2nd Year, Shaheed Rajguru College of Applied Sciences  
for Women, University of Delhi

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | <u>Yes</u> / No  |
| 13. I would like to participate in other hands-on workshops organized. | <u>Yes</u> / No  |

14. Comments about the workshop:

I really liked how the workshop started with the basics  
and then built on. Having done these experiments for the  
first time it was a lot of fun and a bit challenging  
as well. Looking forward to upcoming workshops.

15. Other topics on which you would like to attend a workshop:

Bioinformatics, Cancer Biology, CRISPR

Signature Alex  
19/03

Date: 19/03/2022

Your feedback is sincerely appreciated. Thank you.



Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022

Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: Vaishnavi Singh,  
vaishnavi.9.singh@gmail.com 9873235055

Course-Subject, Year of study, College/University: Biochemistry hons. II year  
Daulat Ram college / Delhi University

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |           |
|--|-----------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 5 |
| 2. The content is relevant to my work.                                 | 1 2 3 4 5 |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 5 |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 5 |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 5 |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 5 |
| 7. The instructors were good.  | 1 2 3 4 5 |
| 8. The instructors were helpful.                                       | 1 2 3 4 5 |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 5 |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 5 |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 5 |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No  |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No  |

14. Comments about the workshop:

The workshop was very insightful. It not only taught me the methods to isolate & manipulate the nucleic acid but also how to apply them for future research.

15. Other topics on which you would like to attend a workshop:

Bioinformatics and genomics

Signature Vaishnavi Date: 18/03/2022.

Your feedback is sincerely appreciated. Thank you.



**Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022**

**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: Varun Bhardwaj  
Varumbhardwaj99@gmail.com, 9212346939.

Course-Subject, Year of study, College/University: Msc. Microbiology, 1st Year,  
Sharda University.

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

**14. Comments about the workshop:**

Workshop was great, learned a lot from here. The things that  
I had heard in the books, I did it here with my own hands like pipette  
handling techniques, also how to isolate plasmid DNA, DNA sequencing  
technique etc. Overall experience was so good faculty and facilities are top notch.

**15. Other topics on which you would like to attend a workshop:**

Gene cloning, Immunology, Proteome analysis.

Signature Varun Date: 19/03/22

Your feedback is sincerely appreciated. Thank you.



Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022

Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: Beauty Kumari  
dubeybeauty01@gmail.com, 9319085343

Course-Subject, Year of study, College/University: M.Sc. Zoology, Second year,  
Hindu College / University of Delhi.

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |             |
|--|-------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 5 ✓ |
| 2. The content is relevant to my work.                                 | 1 2 3 4 5 ✓ |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 5 ✓ |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 5 ✓ |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 5 ✓ |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 5 ✓ |
| 7. The instructors were good.  | 1 2 3 4 5 ✓ |
| 8. The instructors were helpful.                                       | 1 2 3 4 5 ✓ |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 5 ✓ |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 5 ✓ |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 5 ✓ |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No ✓  |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No ✓  |

14. Comments about the workshop:

Thank You! " Workshop was very good and met my expectations". I  
think all the students should benefit from this workshop. I  
learned a lot, and as a budding scientist am excited to  
implement these concepts to my own research.

15. Other topics on which you would like to attend a workshop:

I would like to attend Hands-On Workshop on "Recombinant  
DNA Technology - cloning, Protein Expression & protein Purification"

Signature Beauty Kumari Date: 19/03/22

Your feedback is sincerely appreciated. Thank you.



**Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022**

**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: BHOOMIKA ARORA, arora0567bhoomika@gmail.com,  
91-8800861677

Course-Subject, Year of study, College/University: MSc. BIOCHEMISTRY, JANIA MILLIA  
ISLAMIA UNIVERSITY, Department of BIOSCIENCES

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 <u>4</u> 5 |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 <u>4</u> 5 |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 <u>4</u> 5 |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | <u>Yes</u> / No  |
| 13. I would like to participate in other hands-on workshops organized. | <u>Yes</u> / No  |

**14. Comments about the workshop:**

I gained a lot of knowledge from this workshop, not only practical knowledge but principles & other aspects of research were also taught. Aamir sir explained the concepts of experiments & also taught to troubleshoot the problems. Shreyas Mom was very patient & helpful & taught to load the samples very well on gel.

**15. Other topics on which you would like to attend a workshop:**

Protein purification, cell culture, animal model handling, genetic engineering  
like RT-PCR and cloning.

Signature Bhoomika. Date: 19-03-22

Your feedback is sincerely appreciated. Thank you.



**Workshop on**  
**Techniques for manipulation of Nucleic acids for applications in Genomics,**  
**March 11-21, 2022**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)**  
**University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: SUDHANSHU SHUKLA  
sudhanshushukla2206@gmail.com 8423900888

Course-Subject, Year of study, College/University: BSc CH Biochemistry  
II<sup>nd</sup> Year (IV<sup>th</sup> sem) Shivaji College University of Delhi

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |             |
|--|-------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 (5) |
| 2. The content is relevant to my work.                                 | 1 2 3 4 (5) |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 (5) |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 (5) |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 (5) |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 (4) 5 |
| 7. The instructors were good.  | 1 2 3 4 (5) |
| 8. The instructors were helpful.                                       | 1 2 3 4 (5) |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 (5) |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 (5) |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 (5) |
| 12. Would you recommend this workshop to a colleague?                  | (Yes) / No  |
| 13. I would like to participate in other hands-on workshops organized. | (Yes) / No  |

14. Comments about the workshop:

The workshop provided me a very good hands  
on experiment about how to isolate DNA and how  
to sequence it. Overall it added a great touch  
to skills.

15. Other topics on which you would like to attend a workshop:

Bioinformatics, Technique like SDS PAGE, ELISA etc

Signature Sudhanshu Shukla

Date: 19 / March / 2022

Your feedback is sincerely appreciated. Thank you.



Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022

Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: Sikander Pratap Singh,  
Sikanderpratap Singh@gmail.com, 7827964105

Course-Subject, Year of study, College/University: B.Sc. Hons Biochemistry,  
II year, Shriyaji College, University Of Delhi

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | <u>Yes</u> / No  |
| 13. I would like to participate in other hands-on workshops organized. | <u>Yes</u> / No  |

14. Comments about the workshop:

I had a very great time in this workshop. It enhanced my confidence and my passion about science. It was very informative, interesting and knowledgeable. My scientific aptitude has been totally changed.

15. Other topics on which you would like to attend a workshop:

I want workshop related to this topic only but on further extent, like continuing it further as I have interest in DNA, like in terms of Biotechnology.

Signature Sikander Date: 19/03/2022

Your feedback is sincerely appreciated. Thank you.



Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022

Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: Himani Sareen, sareen.himani2001@gmail.com  
7009703563

Course-Subject, Year of study, College/University: B.Sc. (H) Biochemistry, 3rd year,  
University of Delhi (Shahid Rajguru College of Applied Sciences  
for Women)

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

14. Comments about the workshop:

The 10-days taught me about nucleic acids and  
its estimation. The instructors supported us in all  
the experiments and boosted our morale. All in all,  
it was a never-forgetting experience that helped  
me in improving my wet lab skills.

15. Other topics on which you would like to attend a workshop:

I would definitely interested in a workshop  
centred around bioinformatics and genomics in  
the future that would enhance my in-vitro abilities.

Signature Himani Sareen Date: 19/03/2022

Your feedback is sincerely appreciated. Thank you.



**Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022**

**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021**

Participant Name, e-mail, phone number: Nancy , nancymalik918@gmail.com ,  
7053480126

Course-Subject, Year of study, College/University: B.Sc. (hons.) Microbiology , IIIrd  
year, Bhaskaracharya College of Applied Sciences, University of Delhi.

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 4 <u>5</u> |
| 5. The teaching level of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 4 <u>5</u> |
| 7. The instructors were good.  | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

**14. Comments about the workshop:**

This is one of best workshop for hands-on training. It gives  
the opportunity to enhance & skills in a short time period  
and exposure with various machines and instruments  
which are not available in a normal laboratory.

**15. Other topics on which you would like to attend a workshop:**

Molecular biology techniques like SDS-PAGE, Southern Blotting, PCR  
etc. , different types of chromatography & centrifugation etc.

Signature Malik Date: 19/03/2022.

Your feedback is sincerely appreciated. Thank you.



Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics,  
March 11-21, 2022

Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
and Delhi School of Skill Enhancement and Entrepreneurship Development (DSSEED-IoE)  
University of Delhi South Campus, New Delhi 110021

Participant Name, e-mail, phone number: SONAIL KARMAKAR, karmakarsonail777@gmail.com  
7717757614

Course-Subject, Year of study, College/University: Microbiology, Second Year,  
Phaskaracharya College Of Applied Sciences, Delhi University

INSTRUCTIONS

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop facilities were suitable and appropriate               | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me good practice.              | 1 2 3 <u>4</u> 5 |
| 5. The teaching level of this workshop was appropriate.                | 1 2 <u>3</u> 4 5 |
| 6. The pace of this workshop was appropriate.                          | 1 2 3 <u>4</u> 5 |
| 7. The instructors were good.  | 1 2 3 <u>4</u> 5 |
| 8. The instructors were helpful.                                       | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                     | 1 2 3 <u>4</u> 5 |
| 10. I will be able to use what I learned in this workshop.             | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.          | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                  | Yes / No         |
| 13. I would like to participate in other hands-on workshops organized. | Yes / No         |

14. Comments about the workshop:

It was an amazing experience. Helped me in learning  
the basic techniques in detail. Also broadened  
the depth of my hands on experience beyond  
the mere theoretical part.

15. Other topics on which you would like to attend a workshop:

Protein purification techniques

Signature Sonail.

Date: 19/03/22

Your feedback is sincerely appreciated. Thank you.

# **TECHNIQUES FOR MANIPULATION OF NUCLEIC ACIDS FOR APPLICATIONS IN GENOMICS**

**ORGANISED BY**

**DBT Supported Genomic Facility  
CIIDRET, UDSC**

**JUNE 10-22, 2019**

**VENUE: UNIVERSITY OF DELHI SOUTH CAMPUS**

**COORDINATOR: Prof. V. K. CHAUDHARY  
CONVENOR: Dr. AMITA GUPTA**



# Techniques for manipulation of Nucleic acids for applications in genomics

10 June – 22 June 2019

University of Delhi South Campus

The coursework will include classroom lectures as well as hands-on exercises on various aspects to give the participants good training in the techniques for manipulation of nucleic acids. This workshop will provide hands-on exposure to methods for isolation and nucleic acid manipulation techniques for genomics. These techniques are interdisciplinary in nature and are required in almost all areas of research.

## Content

- Introduction to the workshop and Nucleic acid isolation technology.
- Methods for DNA isolation, Hands-on isolation of Plasmid DNA and chromosomal DNA.
- Agarose gel electrophoresis of isolated DNA.
- Quantitation of DNA, storage of isolated DNA.
- Automated DNA sequencing and analysis of data.
- Questionnaire and submission of workshop report.

No. of seats- 15 students (First come first serve basis)

Venue: University of Delhi South Campus, New Delhi

Timing: 10:00 - 5:30 pm

**Workshop Fee:** There is a workshop fee of Rs. 2000 per person. This amount will be fully refunded and certificate will be issued to only those participants who successfully attend and complete the full duration of the course.

**How to Apply:** Fill in the registration form and submit along with the registration fee at the following address:

Dr. Amita Gupta

CIIDRET

First floor Engineering department,

University of Delhi South campus, New Delhi 110021

LAST DATE for Application: 30 MAY 2019

**Organised by:** DBT-supported Genomics Facility at CIIDRET,  
University of Delhi South Campus

[udscmac@south.du.ac.in](mailto:udscmac@south.du.ac.in), [udscdnaseq@gmail.com](mailto:udscdnaseq@gmail.com); 011-24117542

## COURSE SCHEDULE

DATE	BATCH 1	BATCH 2
<b>10<sup>th</sup> June (Monday)</b>	Introduction to the workshop Introduction of faculty & participants Introduction to all the equipment Practice of Pipetting Nucleic acid isolation technology- Principles & Methods	
	Demonstration of inoculation for isolation of plasmid DNA	Demonstration of inoculation for isolation of Genomic DNA
<b>11<sup>th</sup> June (Tuesday)</b>	Demonstration of isolation of plasmid DNA by PEG precipitation and analysis by agarose gel electrophoresis	Demonstration of isolation of genomic DNA by Phenol-Chloroform Extraction method and analysis by agarose gel electrophoresis
	Hands-on inoculation for isolation of Plasmid DNA	Hands-on inoculation for isolation of Genomic DNA and analysis
<b>12<sup>th</sup> June (Wednesday)</b>	Hands-on Isolation of plasmid DNA by PEG precipitation method and analysis by agarose gel electrophoresis	Hands-on Isolation of genomic DNA by Phenol-Chloroform extraction method and analysis by agarose gel electrophoresis
	Demonstration of inoculation for isolation of Genomic DNA	Demonstration of inoculation for isolation of plasmid DNA
<b>13<sup>th</sup> June (Thursday)</b>	Demonstration of isolation of genomic DNA by Phenol-Chloroform Extraction method and analysis by agarose gel electrophoresis	Demonstration of isolation of plasmid DNA by PEG precipitation and analysis by agarose gel electrophoresis
	Hands-on Inoculation for isolation of genomic DNA	Hands-on Inoculation for isolation of plasmid DNA
<b>14<sup>th</sup> June (Friday)</b>	Hands-on Isolation and analysis of genomic DNA by phenol-chloroform extraction method and analysis by agarose gel electrophoresis	Hands-on Isolation of plasmid DNA by PEG precipitation method and analysis by agarose gel electrophoresis
<b>15<sup>th</sup> June (Saturday)</b>	Observation of isolated DNA samples on agarose gel and compilation of results	
	Demonstration of the technique for checking the quality of DNA by Nanodrop	
	DNA Sequencing- Principles & Methods	
<b>17<sup>th</sup> June (Monday)</b>	Sequencing of isolated plasmid DNA (setting up of reaction)	
	Processing of samples for automated DNA sequencing	
<b>18<sup>th</sup> June (Tuesday)</b>	Discussion/Queries and analysis of sequencing data	
	Demonstration of inoculation for isolation of plasmid DNA	
<b>19<sup>th</sup> June (Wednesday)</b>	Demonstration of isolation of plasmid DNA by Spin Column Method and analysis by agarose gel electrophoresis	
	Hands-on inoculation for isolation of Plasmid DNA	
<b>20<sup>th</sup> June (Thursday)</b>	Hands-on Isolation and analysis plasmid DNA by spin column method	
	Analysis of isolated DNA samples by agarose gel electrophoresis	
<b>21<sup>st</sup> June (Friday)</b>	Compilation of all lab work and result; Submission of workshop report. Feedback on workshop	
<b>22<sup>nd</sup> June (Saturday)</b>	Valedictory Function	

## LIST OF PARTICIPANTS

<b><u>S.No</u></b>	<b><u>NAME</u></b>	<b><u>COURSE AND COLLEGE</u></b>
1.	Harsh Mahawar	B.Sc (H) Biochemistry 3 <sup>rd</sup> year, Shivaji College, University of Delhi
2.	Devika Maggo	B.Sc (H) Biochemistry 3 <sup>rd</sup> year, Shivaji College, University of Delhi
3.	Mansi Tanwar	B.Sc (H) Biochemistry 2 <sup>nd</sup> year, Shivaji College, University of Delhi
4.	Harsh Raheja	B.Sc (H) Biochemistry 3 <sup>rd</sup> year, Shivaji College, University of Delhi
5.	Shruti Khandelwal	B.Sc (H) Biochemistry 3 <sup>rd</sup> year, Shivaji College, University of Delhi
6.	Sparsh Singh	B.Sc (H) Biochemistry 2 <sup>nd</sup> year, Shivaji College, University of Delhi
7.	Niharika Jain	B.Sc (H) Biochemistry 3 <sup>rd</sup> year, Shivaji College, University of Delhi
8.	Hardik Singhal	B.Sc (H) Biochemistry 2 <sup>nd</sup> year, Shivaji College, University of Delhi
9.	Himanshi	B.Sc (H) Biochemistry 2 <sup>nd</sup> year, Shivaji College, University of Delhi
10.	Simran Kardam	B.Sc (H) Biochemistry 3 <sup>rd</sup> year, Shivaji College, University of Delhi
11.	Sakshi Saini	B.Sc (H) Biochemistry 2 <sup>nd</sup> year, Sri Venkateswara College, University of Delhi
12.	Sushmita Sahoo	B.Sc (H) Biochemistry 2 <sup>nd</sup> year, Sri Venkateswara College, University of Delhi
13.	Shubham Aggarwal	B.Sc (H) Microbiology 3 <sup>rd</sup> year, Swami Shradhanand College, University of Delhi
14.	Ahmed Hussain	B.Tech Biotechnology, 3 <sup>rd</sup> year, Netaji Subhash Institute of Technology, Delhi
15.	Deepak Khatri	B.Tech Biotechnology, 3 <sup>rd</sup> year, Netaji Subhash Institute of Technology, Delhi
16.	Sagar Saini	B.Tech Biotechnology, 3 <sup>rd</sup> year, Netaji Subhash Institute of Technology, Delhi

A hands-on training workshop for undergraduate students was organized by CIIDRET at UDSC from 10 June – 22 June 2019. The theme of the workshop was “Techniques for Manipulation of Nucleic Acids for Applications in Genomics”. The workshop included classroom lectures and hands on training modules. Various theoretical aspects covering plasmids, their features, different methods of isolation and purification of plasmid DNA and genomic DNA were discussed by Professor Vijay K Chaudhary, Director CIIDRET and Dr. Amita Gupta, Core member CIIDRET. Prof. Chaudhary also gave the participants a glimpse of his scientific journey and how from humble beginnings he went on to accomplish great feats. Another inspirational lecture-cum-interaction was with Prof. Rakesh Bhatnagar, Vice Chancellor, BHU. Prof. Bhatnagar illustrated how from simple beginnings and numerous hardships, he went on to achieve things in his professional career. He addressed the importance of perseverance and hard work for success in life.

The hands-on practical training was conducted in a manner that every student performed each and every step of each experiment independently. For this, the 16 participants were divided into 2 batches with 2 instructors. The batches were swapped after completion of one module so that they could benefit from the methodologies of both the instructors and learn all the skills in a systematic manner. All the participants were able to achieve the goals of the workshop. Their enthusiasm and interest was apparent from their 100% attendance on all days, presence throughout the long working hours, constant interactions and zeal to know more, making videos of the processes with their mobile phones and their desire to continue working at CIIDRET beyond the duration of the workshop. Even the refreshment break was enjoyed by them with snacks as per their desire. In fact, they expressed the desire to attend more workshops on several topics to master the skills for becoming good researchers.

The valedictory function was organized on the last day of the workshop. The participants listened to Prof. Anil K Tyagi telling them about his scientific journey. Another lecture was by Dr. Pradip Desai, the founder chairman of the company Span Diagnostics Ltd., the industry leader in Indian diagnostic market. Dr. Desai told the students how from very ordinary beginnings he went to medical school and topped every exam. He could have become a great doctor but he wanted to do research. So with his medical education, he also carried out research and went on to establish Span diagnostics with 2 more friends. He told how he managed the expenses and gradually got the company to become the diagnostic industry leader. This entrepreneurial

journey was a great inspiration for the young participants. Over lunch and subsequent photo session, it was clearly evident that all the participants had thoroughly enjoyed their entire duration of the workshop.

The photos from the workshop and participant feedback are enclosed. CIIDRET is holding another workshop on Recombinant proteins: Expression, Purification, Characterization from 2-16 July 2019 for teachers and scientists from Delhi University and other Universities and Institutions.

**Interaction with Prof Rakesh Bhatnagar,  
Vice Chancellor BHU**



**Lecture by Prof. Vijay K Chaudhary**



**Hands-on training in the workshop**



## **Valedictory Function**

### **Interaction with Teachers/Scientists**



**Prof. Anil K Tyagi, Former Vice Chancellor GGSIPU  
Prof. Vijay Chaudhary, Incharge, CIIDRET**



**Dr. Pradip Desai, Chairman, Span Divergent Ltd. Surat**



## Certificate Distribution



## Interaction over refreshments



## Group Photograph





## **WORKSHOP FEEDBACK BY PARTICIPANTS**



**Summer Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: Ahmed Hussain, ahmedh.bti.16@nsit.net.in,  
9717200726

Course, Year of study, Institute: B.E, 2016-2020, NSIT

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                     | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 4 <u>5</u> |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 4 <u>5</u> |
| 7. The instructors were well prepared.                                     | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.   | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                      | Yes / No         |
| 13. I would like to participate in a hands-on workshop of longer duration. | Yes / No         |

14. Comments about the workshop:

Good location & environment, teachers & instruc-  
tors were really helpful.

15. Other topics on which you would like to attend a workshop:

Data Mining, Bioinformatics, RDT.

Signature

Date:

21/6/19

Your feedback is sincerely appreciated. Thank you.



**Summer Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: Sushmita Sahoo  
sushmitasahoo64@gmail.com 9354208733

Course, Year of study, Institute: Bsc. Biochemistry (hons). completed IV-semester  
Sri Venkateswara College

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                     | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 <u>4</u> 5 |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 <u>4</u> 5 |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 3 <u>4</u> 5 |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 <u>4</u> 5 |
| 7. The instructors were well prepared.                                     | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.   | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 <u>4</u> 5 |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                      | <u>Yes</u> / No  |
| 13. I would like to participate in a hands-on workshop of longer duration. | <u>Yes</u> / No  |

14. Comments about the workshop:

The workshop activities enhanced my learning, hence, it was a  
good workshop. Location was also appropriate.

15. Other topics on which you would like to attend a workshop:

I would like to attend a workshop related to proteins

Signature

Sushmita

Date: 21st June 2019

Your feedback is sincerely appreciated. Thank you.



**Summer Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: Simran kadam , skrdaam22@gmail.com  
7292062061

Course, Year of study, Institute: Bsc (hons) Biochemistry , II<sup>nd</sup> year ,  
Swiraji college Delhi University

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 <u>4</u> 5 |
| 2. The content is relevant to my work.                                     | 1 2 3 <u>4</u> 5 |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 4 <u>5</u> |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 4 <u>5</u> |
| 7. The instructors were well prepared.                                     | 1 2 3 <u>4</u> 5 |
| 8. The instructors were helpful.   | 1 2 3 <u>4</u> 5 |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 <u>4</u> 5 |
| 12. Would you recommend this workshop to a colleague?                      | <u>Yes</u> / No  |
| 13. I would like to participate in a hands-on workshop of longer duration. | <u>Yes</u> / No  |

14. Comments about the workshop:

Overall It was good , Time was properly managed , none of  
the reagents or experiments were out of the topic we can  
easily co-relate the practice with learning

15. Other topics on which you would like to attend a workshop:

I wish If we can work on "food preservation" as also  
we can utilize the campus for harvesting some crops or  
vegges to try out some experiments for their preservation

Signature Simran kadam Date: 21 June 2019

Your feedback is sincerely appreciated. Thank you.



**Summer Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: SHUBHAM AGGARWAL  
aggarwalshubham247@gmail.com , 8744086979 , 8800746935

Course, Year of study, Institute: MICROBIOLOGY , III<sup>rd</sup> year , Swami Shroaddhanand  
college

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 <u>4</u> 5 |
| 2. The content is relevant to my work.                                     | 1 2 3 <u>4</u> 5 |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 <u>4</u> 5 |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 4 <u>5</u> |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 <u>3</u> 4 5 |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 <u>4</u> 5 |
| 7. The instructors were well prepared.                                     | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.   | 1 2 3 <u>4</u> 5 |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 <u>4</u> 5 |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 <u>4</u> 5 |
| 12. Would you recommend this workshop to a colleague?                      | <u>Yes</u> / No  |
| 13. I would like to participate in a hands-on workshop of longer duration. | <u>Yes</u> / No  |

14. Comments about the workshop:

The workshop is very good. I learnt a lot from the workshop  
which would help me in my future. The instructors were good,  
helpful and well prepared.  
Thank you.

15. Other topics on which you would like to attend a workshop:

Gene cloning , Protein purification and DNA fingerprinting and  
hybridisation

Signature Shubham Date: 21/6/2019

Your feedback is sincerely appreciated. Thank you.



**Summer Workshop on**  
**Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: Mansi Tanwar  
mansi.tanwar055@gmail.com , 9560366826

Course, Year of study, Institute: B.Sc (Hons.) Biochemistry, II<sup>nd</sup> year,  
Shivaji College, University of Delhi

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                     | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 4 <u>5</u> |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 3 <u>4</u> 5 |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 4 <u>5</u> |
| 7. The instructors were well prepared.                                     | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.   | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                      | <u>Yes</u> / No  |
| 13. I would like to participate in a hands-on workshop of longer duration. | <u>Yes</u> / No  |

**14. Comments about the workshop:**

It was a great experience as we got to learn and  
perform various experiments about DNA isolation and also,  
learnt about working of various other new equipment like Speed-Vac,  
Gel-doc, etc.

**15. Other topics on which you would like to attend a workshop:**

Gene, genomics and bioinformatics.

Signature Mansi

Date: 21<sup>st</sup> June 2019

Your feedback is sincerely appreciated. Thank you.



**Summer Workshop on  
Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: Himanshi, kajalkaur2200@gmail.com  
8920811767

Course, Year of study, Institute: BSC(H) Biochemistry, II<sup>nd</sup> year Shivaji colleg  
Delhi University

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 <u>4</u> 5 |
| 2. The content is relevant to my work.                                     | 1 2 3 <u>4</u> 5 |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 4 <u>5</u> |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 3 4 <u>5</u> |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 4 <u>5</u> |
| 7. The instructors were well prepared.                                     | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.   | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                      | <u>Yes</u> / No  |
| 13. I would like to participate in a hands-on workshop of longer duration. | <u>Yes</u> / No  |

14. Comments about the workshop:

It was a good experience for me. The instructors were so helpful and really nice to us. The lab was ~~so~~ well managed and it feel really good to work in a lab whose environment is so peaceful and really clean. It will be definitely help me.

15. Other topics on which you would like to attend a workshop:

Cloning and expression of Animal Gene

Signature Himanshi

Date: 21-06-2019

Your feedback is sincerely appreciated. Thank you.



**Summer Workshop on**  
**Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: Harish Mahawax, harishmahawax98@gmail.com  
+91 9818441116

Course, Year of study, Institute: B.Sc(H)-Biochemistry - 3<sup>rd</sup> year, Shreeji College  
University of Delhi.

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 <u>4</u> 5 |
| 2. The content is relevant to my work.                                     | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 <u>4</u> 5 |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 <u>4</u> 5 |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 3 <u>4</u> 5 |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 <u>4</u> 5 |
| 7. The instructors were well prepared.                                     | 1 2 3 <u>4</u> 5 |
| 8. The instructors were helpful.   | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 4 <u>5</u> |
| 12. Would you recommend this workshop to a colleague?                      | <u>Yes</u> / No  |
| 13. I would like to participate in a hands-on workshop of longer duration. | <u>Yes</u> / No  |

14. Comments about the workshop:

A very <sup>good</sup> exposure to higher research equipments & techniques. Good  
Mentorship & answers to queries.

15. Other topics on which you would like to attend a workshop:

Gene cloning, Recombinant DNA technology, Computer &  
Integrated Sciences - Bioinformatics, Proteonomics & Protein purification  
assays

Signature

Harish

Date: 21<sup>st</sup> June 2019

Your feedback is sincerely appreciated. Thank you.



**Summer Workshop on**  
**Techniques for manipulation of Nucleic acids for applications in Genomics, June 10-22, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, e-mail, phone number: HARDIK SINGHAL; 99.9ardik.s@gmail.com  
9990611707

Course, Year of study, Institute: B.Sc BIOCHEMISTRY (H), II year, SHIVAJI COLLEGE,  
DELHI UNIVERSITY

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate      | 1 2 3 <u>4</u> 5 |
| 2. The content is relevant to my work.                                     | 1 2 3 <u>4</u> 5 |
| 3. The workshop activities stimulated my learning.                         | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me sufficient practice.            | 1 2 3 4 <u>5</u> |
| 5. The difficulty level of this workshop was appropriate.                  | 1 2 3 <u>4</u> 5 |
| 6. The pace of this workshop was appropriate.                              | 1 2 3 <u>4</u> 5 |
| 7. The instructors were well prepared.                                     | 1 2 3 4 <u>5</u> |
| 8. The instructors were helpful.   | 1 2 3 4 <u>5</u> |
| 9. I accomplished the objectives of this workshop.                         | 1 2 3 4 <u>5</u> |
| 10. I will be able to use what I learned in this workshop.                 | 1 2 3 4 <u>5</u> |
| 11. The workshop was a good way for me to learn this content.              | 1 2 3 <u>4</u> 5 |
| 12. Would you recommend this workshop to a colleague?                      | <u>Yes</u> / No  |
| 13. I would like to participate in a hands-on workshop of longer duration. | <u>Yes</u> / No  |

14. Comments about the workshop:

This workshop taught me a lot about the DNA sequencing and  
Genomics techniques, I can use these techniques in my future  
platform. The environment was very friendly and working. I am really  
very happy to be a part of this workshop.

15. Other topics on which you would like to attend a workshop:

I would like to explore myself on this topic. As this workshop  
was for 2 weeks all the genomic techniques were not taught. I would  
like to have prior knowledge about this topic.

Signature

*Hardik Singhal*

Date: 21/6/19

Your feedback is sincerely appreciated. Thank you.

# **STUDENTS' WORKSHOP ON EXPRESSION OF RECOMBINANT PROTEINS**

**DECEMBER 17-21, 2019  
VENUE: UNIVERSITY OF DELHI SOUTH CAMPUS**

**COORDINATOR: Prof. V. K. CHAUDHARY  
CONVENOR: Dr. AMITA GUPTA**



# Expression of Recombinant proteins

17 - 21 December 2019

CIIDRET, University of Delhi South Campus

The coursework will include classroom lectures as well as hands-on exercises on various aspects to give the participants good training in the expression of recombinant proteins in *E. coli*. This workshop will provide hands-on exposure to methods for inducible and regulated expression of proteins in *E. coli*. These techniques are inter-disciplinary in nature and are required in almost all areas of research.

## Content

- Introduction to the workshop and methods for expression of recombinant proteins.
- Inoculation, expression, localization and analysis of expressed recombinant protein.
- Polyacrylamide gel electrophoresis of expressed proteins.
- Questionnaire and submission of workshop report.

No. of seats- 15 students (First come first serve basis)

Venue: University of Delhi South Campus, New Delhi

Timing: 9:30 - 5:30 pm

**Workshop Fee:** There is a workshop fee of Rs. 2000 per person. This amount will be fully refunded and certificate will be issued to only those participants who successfully attend and complete the full duration of the course.

## How to Apply:

Submit the registration form along with the fee at:

Dr. Amita Gupta,

First floor Engineering department,

University of Delhi South campus, New Delhi 110021

(Find more details on <http://ciidret.du.ac.in/>)

LAST DATE for Application: 15 DECEMBER 2019

**Organised by:** CIIDRET, University of Delhi South Campus  
[udscmac@south.du.ac.in](mailto:udscmac@south.du.ac.in), [udscdnaseq@gmail.com](mailto:udscdnaseq@gmail.com); 011-24117542

## COURSE SCHEDULE

DATE	BATCH 1	BATCH 2
<b>17<sup>th</sup> December (Tuesday)</b>	Introduction to the workshop Lecture: Expression of recombinant proteins in prokaryotic systems (E. coli), vector systems, fusion tags, Constitutive and inducible systems	
	Preparation of reagents for protein expression	
	Practice of SDS PAGE	Primary Inoculation for protein expression by auto-induction
<b>18<sup>th</sup> December (Wednesday)</b>	Lecture: Auto-induction method for protein expression.	
	Demonstration of IPTG based expression and SDS PAGE	Demonstration of Protein expression in E. coli using auto – induction and its localization; Demonstration of SDS PAGE
	Primary Inoculation for IPTG and autoinduction based expression	Secondary Inoculation for protein expression by autoinduction
<b>19<sup>th</sup> December (Thursday)</b>	Protein expression in E. coli using IPTG induction	Protein expression in E. coli using auto - induction and its localization
	Secondary Inoculation for protein expression by autoinduction	Primary Inoculation for IPTG based expression
<b>20<sup>th</sup> December (Friday)</b>	Protein expression in E. coli using auto - induction and its localization; Analysis of expressed protein by SDS polyacrylamide gel electrophoresis	Protein expression in E. coli using IPTG induction; Analysis of expressed protein by SDS polyacrylamide gel electrophoresis
	Setting up of western blot	
<b>21<sup>st</sup> December (Saturday)</b>	Immunoblotting to check the expressed protein	
	Analysis and Compilation of results; Discussion and Feedback; Conclusion of the course	
	Valedictory Function and distribution of certificates	

## LIST OF PARTICIPANTS

S.No	Name	Affiliation	Batch
1	Shubham Aggarwal	M.Sc Biophysics AIIMS	1
2	Kritika Jha	B.Sc Microbiology; Swami Shraddhanand College DU	2
3	Harsh Mahawar	B.Sc Biochemistry Shivaji College DU	2
4	Mihir Vardhan Singh	B.Sc Microbiology; Swami Shraddhanand College DU	1
5	Neelima Byahut	B.Sc Microbiology; Swami Shraddhanand College DU	2
6	Niharika Jain	B.Sc Biochemistry Shivaji College DU	1
7	Sparsh Singh	B.Sc Biochemistry Shivaji College DU	2
8	Hardik Singhal	B.Sc Biochemistry Shivaji College DU	1
9	Aayush Srivastava	B.Sc Biochemistry Shivaji College DU	2
10	Sakshi Saini	B.Sc Biochemistry Sri Venkateswara College DU	2
11	Manjulika Bharti	B.Sc Biochemistry Sri Venkateswara College DU	1
12	Sushmita Sahoo	B.Sc Biochemistry Sri Venkateswara College DU	1
13	Sweta Negi	B.Sc Botany; Swami Shraddhanand College DU	2
14	Shitij Gupta	M.Sc Plant Molecular Biology DU	1
15	Sana Khan	M.Sc Zoology DU	2
16	Nidhi	M.Sc Life Sciences Central University of Punjab	2
17	Manisha Gyawali	M.Sc Microbiology Jamia Millia Islamia	1
18	Ayushi Rana	M.Sc Microbiology Jamia Millia Islamia	2
19	Piyush Goel	B.Sc Life Sciences Deshbandhu College DU	1
20	Charvi Lakhani	B.Sc Microbiology; Swami Shraddhanand College DU	2
21	Bharmjeet	B.Sc Microbiology; Swami Shraddhanand College DU	1
22	Anshu Baldia	Ph.D Biochemistry Sri Venkateswara College DU	1

A hands-on training workshop for undergraduate and post-graduate students was organized was organized by Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET) at University of Delhi South Campus from 17-21 December 2019.

The theme of the workshop was “**Expression of Recombinant Proteins**”.

The workshop included classroom lectures and hands on training modules.

The theory lectures were taken by CIIDRET members including Professor V. K. Chaudhary, Dr. Amita Gupta and Dr. Garima Khare. Various theoretical aspects covering bacterial expression vectors, expression strategies, fusion tags, inducible and constitutive exporession systems were discussed.

- The hands-on practical training was conducted in a manner that every participant performed every step of each experiment independently.
- For this, the 22 participants were divided into 2 batches to learn all the skills in a systematic manner.
- The participants were trained for Bacterial Protein Expression by different methods. They also practiced SDS-Polyacrylamide Gel Electrophoresis and were demonstrated Western blotting for proteins.
- All the participants were able to achieve the goals of the workshop.

Their enthusiasm and interest was apparent from their 100% attendance on all days, in spite of some transport issues in Delhi NCR, their presence throughout the long working hours and their desire to continue working at CIIDRET beyond the duration of the workshop. They expressed the desire to attend more workshops on several topics to master the skills for becoming good researchers.

The valedictory function was organized on the last day of the workshop. The photos from the workshop and participant feedback are enclosed.

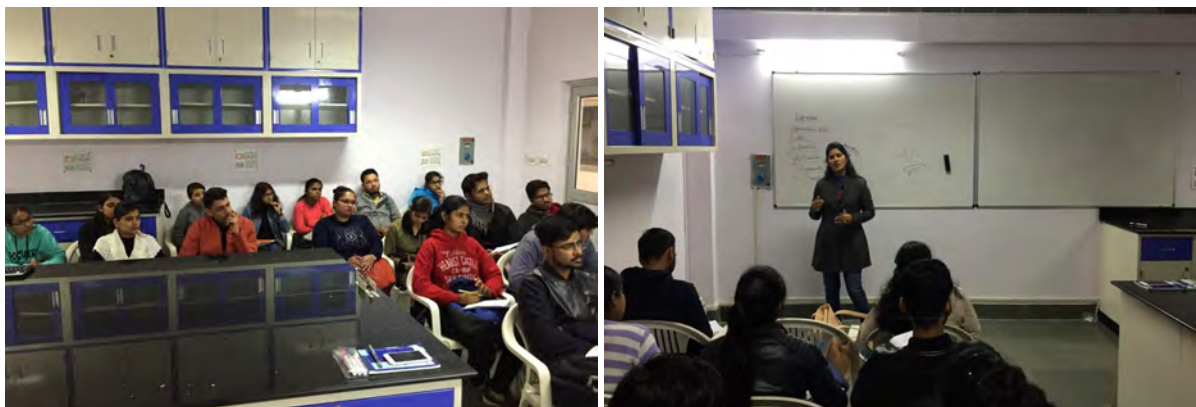
## Hands-on training



**Group Photograph**



**Lecture by Dr. Garima Khare**



## **WORKSHOP FEEDBACK BY PARTICIPANTS**



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Mihir Vardhan Singh,  
mihirvardhan1999@gmail.com, 8700612279

Current designation, Organization: Student, Swami Shradddhanand college,  
Delhi University. (Microbiology, 3<sup>rd</sup> Year)

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop location and facilities were suitable and appropriate 1 2 3 4 5
2. The content is relevant to my work. 1 2 3 4 5
3. The workshop activities stimulated my learning. 1 2 3 4 5
4. The activities in this workshop gave me sufficient practice. 1 2 3 4 5
5. The level and pace of this workshop was appropriate. 1 2 3 4 5
6. The instructors were well prepared and helpful. 1 2 3 4 5
7. I will be able to use what I learned in this workshop. 1 2 3 4 5
8. The workshop was a good way for me to learn this content. 1 2 3 4 5
9. Would you recommend this workshop to a colleague? Yes / No
10. I would like to participate in more hands-on workshops at CIIDRET. Yes / No

11. Comments about the workshop:

I have learned so much through this workshop, especially  
performing SDS-PAGE. Faculty is so much supporting &  
helping. level of their teaching is up to the mark.  
Professor made us clear all the things very appropriately  
ambience is very much excellent. Lab is very clean &  
all the instruments are easily accessible.  
Demonstration of western blotting was very awesome.  
Learn the loop holes which may worsen the results.

12. Other topics on which you would like to attend a workshop:

I ~~would~~ will like to attend some more workshops on :-  
Recombinant DNA Technology (RDT), Genetics, Molecular biology,  
Cell biology & techniques like - PCR, ELISA, Southern blotting, Recombinant  
of proteins & so on.

Signature  Date: 20/12/19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: SHUBHAM AGGARWAL 8744086979  
aggarwalshubham247@gmail.com

Current designation, Organization: Student MSC Biophysics  
AIIMS Delhi

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop location and facilities were suitable and appropriate 1 2 3 4 5
2. The content is relevant to my work. 1 2 3 4 5
3. The workshop activities stimulated my learning. 1 2 3 4 5
4. The activities in this workshop gave me sufficient practice. 1 2 3 4 5
5. The level and pace of this workshop was appropriate. 1 2 3 4 5
6. The instructors were well prepared and helpful. 1 2 3 4 5
7. I will be able to use what I learned in this workshop. 1 2 3 4 5
8. The workshop was a good way for me to learn this content. 1 2 3 4 5
9. Would you recommend this workshop to a colleague? ☒ Yes / No
10. I would like to participate in more hands-on workshops at CIIDRET. ☒ Yes / No Yes

11. Comments about the workshop:

It gives about the exposure to new techniques  
and food/snacks were good.  
we are hoping CIIDRET would organise  
more workshops and we would be very  
motivated and encouraged to be the part of  
more workshops in future also  
Thank You

12. Other topics on which you would like to attend a workshop:

ELISA, Enzyme mobility shift Assay, X ray Crystallography,  
Purification techniques

Signature Shubham

Date: 20/12/2019

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on  
Expression of Recombinant proteins, December 17-21, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: KRITIKA JHA ; 9716985320  
KRITIKA 5 JHA @ gmail . com .

Current designation, Organization: STUDENT , Swami Shradhdhamand  
College , Delhi University

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop location and facilities were suitable and appropriate 1 2 3 4 **5**
2. The content is relevant to my work. 1 2 3 4 **5**
3. The workshop activities stimulated my learning. 1 2 3 4 **5**
4. The activities in this workshop gave me sufficient practice. 1 2 3 4 **5**
5. The level and pace of this workshop was appropriate. 1 2 3 4 **5**
6. The instructors were well prepared and helpful. 1 2 3 4 **5**
7. I will be able to use what I learned in this workshop. 1 2 3 4 **5**
8. The workshop was a good way for me to learn this content. 1 2 3 4 **5**
9. Would you recommend this workshop to a colleague? Yes / No
10. I would like to participate in more hands-on workshops at CIIDRET. Yes / No

**11. Comments about the workshop:**

My first day in workshop was on 17<sup>th</sup> Dec and I was a part  
of Gaurav Sir's group. I was taken aback by the way he conducted  
the workshop, not only he made sure that we get enough of  
practice but also made sure that we didn't return home with a  
single doubt in mind. I got enough of practice and gained much  
experience, so hopefully this would give me an edge over other  
students who didn't attend).

My experience is more than just satisfactory. The labs were  
well conducted and I would really like to attend more  
such workshops! In last, I would like to thank CIIDRET,  
Biotechnology department and all the involved authorities  
for organizing such a valuable workshop.

**12. Other topics on which you would like to attend a workshop:**

ELISA, Purification . etc .

Signature Kritika Jha

Date: 20<sup>th</sup> Dec '19 .

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Ayushi Rana, 9873290757  
ayushirana96@gmail.com

Current designation, Organization: Student (Msc), Jamia Millia Islamia

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |   |
|--|---|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 <input checked="" type="radio"/> 5  |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <input checked="" type="radio"/>  |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <input checked="" type="radio"/>  |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 4 <input checked="" type="radio"/>  |
| 5. The level and pace of this workshop was appropriate.                | 1 2 3 4 <input checked="" type="radio"/>  |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 4 <input checked="" type="radio"/>  |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 4 <input checked="" type="radio"/>  |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 <input checked="" type="radio"/>  |
| 9. Would you recommend this workshop to a colleague?                   | <input checked="" type="radio"/> Yes / No |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | <input checked="" type="radio"/> Yes / No |

11. Comments about the workshop:

Everything about workshop was excellent, it  
enhance my learning and gave me opportunity  
to stimulate my lab practices and handling.  
The instructors were very helpful and explained  
each and every query.

12. Other topics on which you would like to attend a workshop:

ELISA, Protein purification, DNA sequencing,

Signature Ayushi Rana Date: 20/12/19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on  
Expression of Recombinant proteins, December 17-21, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Sakshi Saini  
Saini.sak3@gmail.com, 7838 662022

Current designation, Organization: Student, BSc. Biochemistry (Hons.)  
III - Year, Sri Venkateswara college

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop location and facilities were suitable and appropriate 1 2 3 4 5
2. The content is relevant to my work. 1 2 3 4 5
3. The workshop activities stimulated my learning. 1 2 3 4 5
4. The activities in this workshop gave me sufficient practice. 1 2 3 4 5
5. The level and pace of this workshop was appropriate. 1 2 3 4 5
6. The instructors were well prepared and helpful. 1 2 3 4 5
7. I will be able to use what I learned in this workshop. 1 2 3 4 5
8. The workshop was a good way for me to learn this content. 1 2 3 4 5
9. Would you recommend this workshop to a colleague? Yes/ No
10. I would like to participate in more hands-on workshops at CIIDRET. Yes/ No

11. Comments about the workshop:

The workshop was very effective and will help me to enhance my skills which ultimately will help me in future.  
It was very helpful and got a exposure of as in how to work in labs following the protocol and gave me enough practice. The instructors were well prepared and looking forward to participate in more such workshops in future.

12. Other topics on which you would like to attend a workshop:

- Recombinant DNA technology  
- Clinical Biochemistry

Signature Sakshi Date: 20. Dec. 19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: NEELIMA BYAHUT,  
neelinabyahut75@gmail.com, 9643683561

Current designation, Organization: Student (Microbiology 3<sup>rd</sup> year),  
Swami Shradddhanand college, University of Delhi

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 4 <u>5</u> |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 4 <u>5</u> |
| 5. The level and pace of this workshop was appropriate.                | 1 2 3 4 <u>5</u> |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 4 <u>5</u> |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 4 <u>5</u> |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 <u>5</u> |
| 9. Would you recommend this workshop to a colleague?                   | <u>Yes</u> / No  |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | <u>Yes</u> / No  |

**11. Comments about the workshop:**

The workshop helped me to gain more and more information and also hands-on-practice on protein expression. I can easily do the SDS-PAGE without any confusion. Because of this workshop I can easily do this technique without any problem.  
In this workshop, I ~~also~~ understand ~~the~~ every content without slipping it from our mind because of regular hands-on-practice here. Southern Western blotting was also demonstrated to us which also clear ~~the~~ some of our confusion. I will definitely attend this workshop again.

**12. Other topics on which you would like to attend a workshop:**

1.) Protein purification, 2.) DNA sequencing  
3.) Southern blotting, 4.) Recombination of DNA  
5.) Western blotting, 6.) Chromatography Techniques (HPLC)  
7.) Surface plasma resonance

Signature Byahut Date: 20/12/19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Nidhi bharedwaynidhi693@gmail.com  
7988453953

Current designation, Organization: Student M.Sc Ist year (sp. in human genetics)  
Central University of Punjab

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |             |
|--|-------------|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 4 5 ✓ |
| 2. The content is relevant to my work.                                 | 1 2 3 4 5 ✓ |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 5 ✓ |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 4 5 ✓ |
| 5. The level and pace of this workshop was appropriate.                | 1 2 3 4 5 ✓ |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 4 5 ✓ |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 4 5 ✓ |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 5 ✓ |
| 9. Would you recommend this workshop to a colleague?                   | ✓ Yes / No  |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | ✓ Yes / No  |

11. Comments about the workshop:

By this workshop I am able to learn and hands on  
SDS Page technique. It is very helpful and knowledgeable  
to me. I would like to attend more workshop at  
this place. Please improve refreshment menu.

12. Other topics on which you would like to attend a workshop:

ELISA, Western Blotting and other blotting technique-  
HPLC, X Ray crystallography

Signature Nidhi Date: 20 Dec 2019

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on  
Expression of Recombinant proteins, December 17-21, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Niharika Jain, niharikajain@gmail.com,  
9643975772

Current designation, Organization: Undergraduate (student), Shriyaji College  
(University of Delhi)

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 <u>4</u> 5 |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u> |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u> |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 <u>4</u> 5 |
| 5. The level and pace of this workshop was appropriate.                | 1 2 <u>3</u> 4 5 |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 <u>4</u> 5 |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 <u>4</u> 5 |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 <u>5</u> |
| 9. Would you recommend this workshop to a colleague?                   | <u>Yes</u> / No  |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | <u>Yes</u> / No  |

11. Comments about the workshop:

The workshop was very interactive. It would really help me in  
the various disciplines in future. I would like to participate in  
more such workshops

12. Other topics on which you would like to attend a workshop:

ELISA, genetics, immunology

Signature N. Jain

Date: 20.12.19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on  
Expression of Recombinant proteins, December 17-21, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: SANA KHAN, khansana786154@gmail.com,  
9818316065

Current designation, Organization: Pursuing MSc Zoology from Department  
of Zoology, University of Delhi

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 4 <b>5</b> |
| 2. The content is relevant to my work.                                 | 1 2 3 <b>4</b> 5 |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <b>5</b> |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 <b>4</b> 5 |
| 5. The level and pace of this workshop was appropriate.                | 1 2 3 <b>4</b> 5 |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 4 <b>5</b> |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 4 <b>5</b> |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 <b>5</b> |
| 9. Would you recommend this workshop to a colleague?                   | Yes / No         |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | Yes / No         |

**11. Comments about the workshop:**

Workshop was nice, instructors were very helpful and I would  
like to attend this workshop <sup>again</sup> but on a different topic in  
my summer holidays. Hopefully, when I ~~start~~ would start  
my own research after completion of MSc, this workshop would  
be great and much more helpful.  
Overall, this workshop was Excellent.

P.S. → Please conduct the summer workshop in month  
of June after 15 June 2020. Because on 15 June 2020,  
NTA is conducting CSIR-NET exam for JRF for  
postgraduate students.

**12. Other topics on which you would like to attend a workshop:**

Blotting Techniques, Practicals on Molecular Biology,  
Recombinant DNA Technology or Immunology

Signature [Signature] Date: 26/12/19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on  
Expression of Recombinant proteins, December 17-21, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Bharmjeet, bharmjeetsingh1@gmail.com  
9873278102

Current designation, Organization: Student, Swami Shradhdharam College

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                  |
|--|------------------|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 4 <b>5</b> |
| 2. The content is relevant to my work.                                 | 1 2 3 <b>4</b> 5 |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 <b>4</b> 5 |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 4 <b>5</b> |
| 5. The level and pace of this workshop was appropriate.                | 1 2 3 <b>4</b> 5 |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 4 <b>5</b> |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 4 <b>5</b> |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 <b>5</b> |
| 9. Would you recommend this workshop to a colleague?                   | Yes / No         |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | Yes / No         |

**11. Comments about the workshop:**

Workshop was very helpful, instructors are specially  
helping and take care at every point. Tea snacks can  
be more better. Being the most junior one, it's <sup>not</sup> easy to  
grab everything but the instructors made it so easy  
for me to grab it, understand it and learn it.  
Thank you for this workshop and I want to attend such  
in future also.

**12. Other topics on which you would like to attend a workshop:**

Gene Manipulation, hybridisation, Southern blotting,  
sequencing and other releatable hands on.

Signature Bharmjeet

Date: 20/12/19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: ANSHU BALDIA, anshubaldia@gmail.com  
7292008066

Current designation, Organization: PhD Scholar Department of Biochemistry  
Sri Venkateshwar College, Delhi

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop location and facilities were suitable and appropriate 1 2 3 4 5
2. The content is relevant to my work. 1 2 3 4 5
3. The workshop activities stimulated my learning. 1 2 3 4 5
4. The activities in this workshop gave me sufficient practice. 1 2 3 4 5
5. The level and pace of this workshop was appropriate. 1 2 3 4 5
6. The instructors were well prepared and helpful. 1 2 3 4 5
7. I will be able to use what I learned in this workshop. 1 2 3 4 5
8. The workshop was a good way for me to learn this content. 1 2 3 4 5
9. Would you recommend this workshop to a colleague? Yes / No
10. I would like to participate in more hands-on workshops at CIIDRET. Yes / No

11. Comments about the workshop:

- It provide me knowledge about various techniques and practical work.
- It should include the construction of recombinant plasmid and then expression of recombinant protein.

12. Other topics on which you would like to attend a workshop:

- Proteomics
- Construction of recombinant plasmid and expression and purification of recombinant protein

Signature Anshu Baldia.

Date: 20 Dec, 2019

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Piyush goel, piyushgoel40@gmail.com  
8368404092

Current designation, Organization: Student, B.Sc. Life Sc (III yr), Deshbandhu  
College

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |                                    |
|--|------------------------------------|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 4 <u>5</u>                   |
| 2. The content is relevant to my work.                                 | 1 2 3 4 <u>5</u>                   |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 <u>5</u>                   |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 <u>4</u> <u>5</u> - <u>4</u> |
| 5. The level and pace of this workshop was appropriate.                | 1 2 3 4 <u>5</u>                   |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 4 <u>5</u>                   |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 4 <u>5</u>                   |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 <u>5</u>                   |
| 9. Would you recommend this workshop to a colleague?                   | Yes / No                           |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | Yes / No                           |

**11. Comments about the workshop:**

Workshop provides me enough Knowledge and understanding.  
The lecture of Dr Gurima gives insight to what we are  
going to have hands on practice for the first day. The  
Manual content is to the point and gives description  
of all the experiments.

More Practice <sup>should</sup> be given if and workshop should ~~be~~  
also include other Subjects and topics.

**12. Other topics on which you would like to attend a workshop:**

oDNA technologies, Blotting techniques, rDNA Sequencing etc.

Signature Piyush goel Date: 20/12/19

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on**  
**Expression of Recombinant proteins, December 17-21, 2019**  
**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**  
**UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: Shitij Gupta, gshitij.15@gmail.com  
7982046281

Current designation, Organization: Msc (P), Plant Molecular Biology & Biotechnology,  
Department of plant Molecular Biology, University of Delhi, South Campus

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

1. The workshop location and facilities were suitable and appropriate 1 2 3 4 5
2. The content is relevant to my work. 1 2 3 4 5
3. The workshop activities stimulated my learning. 1 2 3 4 5
4. The activities in this workshop gave me sufficient practice. 1 2 3 4 5
5. The level and pace of this workshop was appropriate. 1 2 3 4 5
6. The instructors were well prepared and helpful. 1 2 3 4 5
7. I will be able to use what I learned in this workshop. 1 2 3 4 5
8. The workshop was a good way for me to learn this content. 1 2 3 4 5
9. Would you recommend this workshop to a colleague? ☒ Yes / No
10. I would like to participate in more hands-on workshops at CIIDRET. ☒ Yes / No

11. Comments about the workshop:

Workshop provides great hands on training, great instructors,  
valuable information was provided in this workshop.

12. Other topics on which you would like to attend a workshop:

Metabolomics, @ Epigenomics,

Signature [Signature] Date: 20/12/2019

Your feedback is sincerely appreciated. Thank you.



**Students' Workshop on  
Expression of Recombinant proteins, December 17-21, 2019  
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)  
UNIVERSITY OF DELHI SOUTH CAMPUS, NEW DELHI 110021**

Participant Name, E-mail, Phone number: HARSH MAHAWAR  
harshmahawar98@gmail.com, 9818441116

Current designation, Organization: B.Sc. (H.) - Biochemistry (Final year) Shivaji college

**INSTRUCTIONS**

Please circle your response to the items. Rate aspects of the workshop on a 1 to 5 scale with 5 being the highest, most positive impression.

- |  |           |
|--|-----------|
| 1. The workshop location and facilities were suitable and appropriate  | 1 2 3 4 5 |
| 2. The content is relevant to my work.                                 | 1 2 3 4 5 |
| 3. The workshop activities stimulated my learning.                     | 1 2 3 4 5 |
| 4. The activities in this workshop gave me sufficient practice.        | 1 2 3 4 5 |
| 5. The level and pace of this workshop was appropriate.                | 1 2 3 4 5 |
| 6. The instructors were well prepared and helpful.                     | 1 2 3 4 5 |
| 7. I will be able to use what I learned in this workshop.              | 1 2 3 4 5 |
| 8. The workshop was a good way for me to learn this content.           | 1 2 3 4 5 |
| 9. Would you recommend this workshop to a colleague?                   | Yes/ No   |
| 10. I would like to participate in more hands-on workshops at CIIDRET. | Yes/ No   |

11. Comments about the workshop:

- Good exposure to various techniques.
- Provided the required skill set.
- Good instructors; in depth concepts made more clear

12. Other topics on which you would like to attend a workshop:

Cloning & Extraction of Proteins

Signature [Signature] Date: 20<sup>th</sup> Dec 19.

Your feedback is sincerely appreciated. Thank you.



*Centre for Innovation in Infectious Disease Research, Education  
and Training (CIIDRET), University of Delhi South Campus  
and  
Wellcome Trust/DBT India Alliance*

## *Workshop Notice*

### **One-day Science Communication Workshop**

**On**

**Monday, the 15<sup>th</sup> July 2019  
Biotech Center Auditorium, 3<sup>rd</sup> Floor Biotech Block,  
University of Delhi South Campus**

#### **Programme:**

9.00 – 9.30 am	Registration
9.30 – 10.15 am	<b>Research Ethics</b>
10.15 – 11.00 am	<b>Basics of Science Communication</b>
11.00 – 11.20 am	Tea Break
11.20 am – 1.00 pm	<b>Writing a Manuscript</b>
1:00 – 1:45 pm	Break
1.45 – 3.00 pm	<b>Writing Grants; India Alliance Funding Opportunities</b>
3.00 – 5.00 pm	<b>Lecture on IPR by Dr. Malathi Lakshmikumaran</b>
5.00 – 5.30 pm	Discussion over High Tea

**Prof. V. K. Chaudhary (9811800434)  
Dr. Amita Gupta (9811509609)  
Email: [ykchaudhary@south.du.ac.in](mailto:ykchaudhary@south.du.ac.in);  
[amitagupta@south.du.ac.in](mailto:amitagupta@south.du.ac.in)**

*All are cordially invited to join for discussion over High tea after the workshop.*



*Centre for Innovation in Infectious Disease Research,  
Education and Training (CIIDRET),  
University of Delhi South Campus*

## *Seminar Notice*

### **Inventions and Intellectual Property Protection: India and abroad**

**Monday, the 15<sup>th</sup> July 2019 at 3.00 P.M.  
Biotech Center Auditorium, 3<sup>rd</sup> Floor Biotech Block,  
University of Delhi South Campus**



**By**

**DR. MALATHI LAKSHMIKUMARAN  
Executive Director & Practice Head of Patents  
Lakshmikumaran and Sridharan Attorneys,  
New Delhi**

Dr. Malathi Lakshmikumaran has more than 30 years of experience in the field of biochemistry and Molecular Biology with an expertise in plant genomics, DNA fingerprinting and genetic transformation. She has successfully supervised several Ph.D. students in the area of Plant Molecular Biology. She has more than 100 publications to her credit in various International and Indian journals. She is a Fellow of the National Academy of Sciences (FNASc).

Prior to joining the firm, she served as the Head, Centre for Bioresource & Biotechnology Division in The Energy and Resource Institute (TERI) for a period of 17 years. At present, she serves as an Executive Director and heads the IP division of the firm. She is a registered patent agent and has been actively engaged in preparing, filing and prosecuting of patent applications, both in India and abroad. She mainly works on pharmaceutical, chemical and biotechnological patent applications. She advises clients on plant variety protection and registration. Dr. Malathi also undertakes extensive work for Start-ups and Incubates, especially with incubates in C-CAMP and IIT Delhi, advising them on Patents and Freedom to operate opinions.

She is recipient of several awards including the prestigious Fogarty Visiting Research Associateship from National Institute of Health, Bethesda, USA and the National Young Women Scientist Award by Department of Biotechnology in March 2000.

**Prof. V. K. Chaudhary  
Chair, IPR Cell,  
University of Delhi**

**Tel: 011-24115883; 9811800434 (9811509609- Amita Gupta)  
Email: [vkchaudhary@south.du.ac.in](mailto:vkchaudhary@south.du.ac.in); [amitagupta@south.du.ac.in](mailto:amitagupta@south.du.ac.in)**

*All are cordially invited to join for discussion over High tea after the seminar.*

# FIRST NATIONAL WORKSHOP ON PROTEIN PURIFICATION AND CHARACTERISATION

FEBRUARY 6-8, 2018  
VENUE: UNIVERSITY OF DELHI SOUTH CAMPUS

COORDINATOR: Prof. V. K. CHAUDHARY  
CONVENOR: Dr. AMITA GUPTA





# **1<sup>st</sup> National Workshop on Protein Purification and Characterization, February 6-9, 2018**

**Organized by Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET), University of Delhi South Campus**

This workshop is specifically designed for Biologists interested in learning chromatographic techniques suitable for laboratory/ analytical and production-scale protein purification. You will learn about techniques, screening and optimization strategies, scale-up issues, column maintenance and process hygiene, regulatory requirements, and column packing. During practical sessions, you will apply these concepts to understand how to screen and optimize the purification of a target protein from a crude feed stream. This course also offers an introduction to membrane separation techniques used in bioprocessing – Crossflow Filtration

The workshop comprises of TWO days of extensive hands on experience on GE Healthcare Lifesciences scalable Protein Purification system “AKTA AVANT” widely used in Biopharma & Biotech Industry.

Each theory session is followed by hands-on session. Two slots are available for registration, Participants can opt for the slot as per the dates convenient to them at the time of registration.

**\*\*\*Each slot will comprise of 6/7 candidates\*\*\***

<b>Dates</b>	<b>SLOT 1: February 6-7, 2018</b> <b>SLOT 2: February 8-9, 2018</b>
<b>Timing</b>	9:30AM - 5:30 PM
<b>Venue</b>	University of Delhi South campus, New Delhi

<b>DAY 1</b> <b>PURIFICATION TECHNIQUES</b>	<b>DAY 2</b> <b>PURIFICATION STRATEGIES</b>
1) Introduction to chromatography	1) Ion exchange chromatography (Theory & Practical)
2) Purification Techniques: Gel Filtration (Theory & Practical)	2) Ion exchange chromatography - Step Optimization (Theory & Practical)
3) Introduction to ÄKTA & UNICORN (Theory & Practical)	3) Purification Strategies (Theory & Practical)
4) Gel Filtration – Desalting (Theory & Practical)	4) Basics of crossflow filtration
5) Affinity Chromatography (Theory & Practical)	5) Experimental results analysis & Discussions

**Application Procedure:** A total of 15 trainees will be accepted based on first-come basis. Registration form and fee (cheque/draft in favor of Director, University of Delhi South Campus) must be submitted for confirmation of registration.

## **Workshop Fee:**

**FOR ACADEMIC REGISTRANTS: Rs. 5000.00**

**FOR INDUSTRY REGISTRANTS: Rs. 10000.00**

**Registration and Fee Deadline- 1<sup>st</sup> Feb, 2018**

**Training partners: GE Healthcare**

**For more details and registration kindly contact us at the below mentioned details:**

**Dr. Amita Gupta**

**Ph: 011-24117542; 24114158**

**E: [udscdnaseq@gmail.com](mailto:udscdnaseq@gmail.com)**

**Mita Gupta**

**Regional Manager North,  
GE Healthcare**

**Ph: +91 9873352562**

**E: [mita.gupta@ge.com](mailto:mita.gupta@ge.com)**

**Hitakshi Singh**

**Area Manager – North,  
GE Healthcare**

**Ph: +91 7032638393**

**E: [HITAKSHI.SINGH@ge.com](mailto:HITAKSHI.SINGH@ge.com)**



**1<sup>st</sup> National Workshop on Protein Purification and Characterization, February 6-7, 2018 and February 8-9, 2018**  
**Organized by Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET), University of Delhi South Campus**

**Day1**

Start	End	Time	Type	Topic Name
9:00	9:30	0:30	Intro	Introduction to the course / Program / Objectives
9:30	10:15	0:45	Lecture	Introduction to chromatography
10:15	11:15	1:00	Lecture	Purification Techniques: Gel Filtration
11:15	11:30	0:15	Break	
11:30	12:15	0:45	Lecture	Introduction to ÄKTA & UNICORN
12:15	13:15	1:00	Practical	Gel filtration - desalting
13:15	14:00	0:45	Lunch	
14:00	15:15	1:15	Lecture	Affinity Chromatography
15:15	15:30	0:15	Break	
15:30	16:30	1:00	Practical	Affinity Chromatography
16:30	17:00	0:30	Video	GE Technical videos
17:00	17:30	0:30	Intro	Open Discussion & Day Summary
17:30				Day End
<b>Total</b>		<b>8:30</b>		

**Day2**

Start	End	Time	Type	Topic Name
9:00	9:30	0:30	Intro	
9:30	10:15	0:45	Lecture	Ion exchange chromatography
10:15	11:15	1:00	Practical	Ion exchange chromatography
11:15	11:15	0:00	Break	
11:15	12:15	1:00	Practical	Ion exchange chromatography Step Optimization
12:15	13:15	1:00	Lecture	Purification Strategies
13:15	14:00	0:45	Lunch	
14:00	14:30	0:30		results & Discussion
14:30	15:15	0:45	Lecture	Basics of crossflow filtration
15:15	15:30	0:15	Break	
15:30	16:30	1:00		Open Discussion
16:30	17:00	0:30		Day Summary
17:00				Day End
<b>Total</b>		<b>8:00</b>		

A hands-on training workshop for research scholars was organized by Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET) at University of Delhi South Campus from February 6-8 2018. GE Healthcare were the industry partners in the workshop.

The theme of the workshop was **“PROTEIN PURIFICATION AND CHARACTERISATION”**.

The workshop included classroom lectures and hands on training modules.

Various theoretical aspects covering expression strategies, fusion tags, purification systems and strategies, different types of chromatography and their applications were discussed. The hands-on practical training was conducted in a manner that every participant got hands on experience with the AKTA platform and the chromatography runs. For this, the participants were divided into 2 batches to learn all the skills in a systematic manner. All the participants were able to achieve the goals of the workshop.