



Report
on
Hands-on-Training *cum* Workshop
on
Advance Techniques in Biotechnology
&
Yeast Genome Engineering

25 August – 02 September 2023

Jointly Organized by
School of Studies in Biotechnology, Pt. Ravishankar Shukla University
&
Alumni Association of Biotechnology
&
HiMedia Laboratories Pvt. Ltd. Mumbai

DAY-1: 25 August 2023

A Hands-on Training *cum* Workshop was jointly organized by the **School of Studies in Biotechnology, Pt. Ravishankar Shukla University (PRSU), Raipur**, and **Alumni Association of Biotechnology, Pt. Ravishankar Shukla University, Raipur**, in collaboration with **HiMedia Laboratories Pvt. Ltd. Mumbai**, from **25 August to 02 September 2023**.

The workshop was inaugurated by **Prof. Sachchidanand Shukla**, Hon'ble Vice-Chancellor, PRSU, Raipur, followed by **Prof. Keshav Kant Sahu**, Head of the Department, School of Studies in Biotechnology, PRSU, Raipur, and other faculty members of the department.

The coordinator of the workshop, **Dr. Nagendra Kumar Chandrawanshi**, shared infographic with the participants. He shared that 95 participants are registered for this event from Guru Ghasidas Central University, Bilaspur; Bhilai Mahila Mahavidyalaya, Bhilai; Govt. Digvijay College, Rajnandgaon; Sant Guru Ghasidas Govt PG College, Kurud; Hemchand University Durg; Govt. Nagarjuna Post Graduate College of Science, Raipur; Seth Phoolchand Agarwal Smriti College, Navapara; Centre for Basic Sciences, PRSU, Raipur, and School of Studies in Biotechnology, PRSU, Raipur. The participants include faculty members, UG and PG students and research scholars.

The expert in the first day of training program was **Dr. Mangesh Manker, Product Expert (Molecular Biology), HiMedia Laboratories Pvt. Ltd. Mumbai**. He spoke about different techniques like DNA isolation using magnetic beads, restriction digestion, and PCR. The highlight of the first day of workshop was the automated cell extractor machine of HiMedia, which was designed for easy isolation of DNA using magnetic beads in a magnetic stirrer. It was a power pack tool that involved all the facilities in one unit only.

After isolation of DNA from same instrument, experiment performed was restriction mapping in which two important enzymes, EcoR1 and HindIII, were used for digestion of sample. After this, the sample was run in an agarose gel electrophoresis to visualize the digested bands on a Gel Doc system. The next experiment was to run PCR, during which basics of PCR were taught, such as denaturation, annealing, extension, *etc.* The students also learned the experimental design of PCR in a very attentive way.

Glimpses of the Day



DAY-2: 26 August 2023

On second day; 26 August 2023, the workshop began at 10:00 am with a briefing and then work of previous day was continued by **Dr. Mangesh Manker** and **Mr. Abhishek Wanjari** of HiMedia Laboratories Pvt. Ltd. Mumbai. The results of the gel electrophoresis were analyzed, and then next technique; purification of IgG by following affinity of IgG to immobilized Protein A, Agarose, was performed. This technique was used for the purification of polyclonal antibodies. When a suspension containing a mixture of substances, including IgG, was loaded onto the column, the IgG bound to the Protein A agarose matrix and was eluted by reducing the pH. The purification was confirmed by electrophoresing the eluted fraction on SDS-PAGE. At 12:00 pm, a tea break was announced for the participants, after which the workshop continued. The preparation of reagents for SDS-PAGE began, which is a technique used to separate proteins based on their molecular weight. The electrophoretic mobility of proteins depends on their size. Experts also demonstrated different stages of SDS-PAGE and their experimental interpretation. At 01:30 pm, participants a lunch break was announced in which participants were provided with refreshments.

After the break, the workshop resumed, and the IgG purification and SDS-PAGE were carried out. After loading of different proteins into the wells and run of SDS-PAGE, a Valedictory Function was organized at 04.30 pm, in which **Dr. Mangesh Manker** and **Mr. Abhishek Wanjari** of HiMedia Laboratories Pvt. Ltd. Mumbai, were presented mementos by **Dr. Afaqur Quraishi**, Associate Professor, School of Studies in Biotechnology, PRSU, and **Dr. Nagendra Kumar Chandrawansi**, coordinator of the workshop. Students were shared their experiences and feedback regarding two-days' workshop. The session concluded with a vote of thanks by **Dr. Shubra Tiwari**, Research Assistant, School of Studies in Biotechnology, PRSU. After Valedictory Function, the results of the SDS-PAGE were analyzed, and an elaborated explanation was provided by **Mr. Abhishek Wanjari**.

On the second day of workshop, participants were learned about the theoretical and practical aspects of IgG purification and SDS-PAGE, and also got to know about handling, precautions, and troubleshooting of these two high-end molecular techniques.

Glimpses of the Day



DAY-3: 28 August 2023

The second segment of this training session started on **28 August 2023** and was based on various aspects of **Yeast Genome Engineering**. It began with a welcome session; the **Head of the department, Prof. Keshav Kant Sahu**, greeted our esteemed alumni and expert of this two days long session, **Dr. Rohini Nair, Department of Medical Biotechnology, Gujrat Biotech University, Gandhi Dham, Gujrat**. Now, Dr. Rohini Nair explained the participant's basic concepts of Yeast Genome Engineering and its practical applications. Also, she briefs the students about practical's and experiments to be performed. She also taught that why Yeast has been chosen as the model organism. The most common Yeast is *Saccharomyces cerevisiae*, which is haploid in nature. It is a haploid eukaryotic organism with 16 sets of chromosomes. It can also be found in two phases and transformed into diploid. It is commonly employed as a model organism since human genes are familiar with yeast genomes.

She asked the groups to choose the practical they wanted to perform among the gene deletion, protein tagging, and mRNA tagging. After that, the students prepared the samples for the cassette amplification and then PCR was performed. Then, a tea break was announced at 12:30 pm; afterwards, she discussed about designing primers using various Bioinformatic Tools and the optimum primer condition, and then assigned the students to design primers for different techniques. Meanwhile, she talked about N and M tagging, which helps in the specific localization of their respective sides to detect presence of any particular gene during genetic transformation of yeast. She also discussed different selection markers, such as kanamycin G418, and how to see the deleted genes. A lunch break was announced at 2:00 pm during which refreshments were provided to all the participants. After the break, while PCR was still under processing, the primary culture of the yeast *Saccharomyces cerevisiae* was prepared. The amplicons obtained out of PCR were analysed in the agarose gel electrophoresis, and Dr. Rohini Nair explained the results to the students. Students asked queries regarding activities performed on the day. Before the day concluded, the expert gave a brief knowledge about the protocols to be performed next day.

Glimpses of the Day



DAY-4: 29 August 2023

Dr. Rohini Nair Ma'am had previously brief about yeast genome, media preparation, and amplification of gene cassette in her previous session, which was held on 28 August 2023. In continuation of that session, on 29 August 2023, Ma'am presented a brief introduction about the genetic transformation through Yeast followed by taking the optical density of overnight grown culture.

Activities of fourth day started at 9:30 am, in which secondary culture of the Yeast was first prepared from the primary culture after its spectrophotometric analysis. The secondary cultures were kept for incubation for about 3 hours. Meanwhile, Dr. Rohini Nair explained the properties and life cycle of *Saccharomyces cerevisiae*. She also discussed why it is used as a model organism. Then, she asked the students questions about the concepts and practical's that were previously discussed and cleared the doubts and queries of the students.

The session continued with a fruitful discussion, and the participants asked queries. After the lunch break, the activity resumed, dealing with a group discussion round of all the participants and their mentors regarding the Ideathon competition scheduled for 2 September 2023. After completion of the incubation of secondary culture of the Yeast, it was used to transform cell culture, and this transformed cell culture was spread over the YPG plates containing antibiotic for the selection of transformed and non-transformed cultures and was kept in incubation for 2 next days.

After completion of the practical's, the Valedictory Function was held, and a memento was presented to the expert of the session; **Dr Rohini Nair** by **Prof. Keshav Kant Sahu Sir** as a token of gratitude. The program ended with a vote of thanks by **Dr Nagendra Kumar Chandrawanshi Sir**. Moreover, the students shared their views and experiences and provided their feedback. At last, Dr Rohini Nair, ma'am, also shared her experience regarding the session. Last but not the least, the session ended with a photo session.

Glimpses of the day



DAY-5: 2 September 2023

On the last day of this 5-days Hands-on Training workshop, *i.e.*, **on 2 September 2023**, an Online Certification Examination and an “**Ideathon**” competition were conducted. All the registered participants appeared for the examination. This examination was conducted in an online mode. The duration of the examination was 45 minutes, with 35 MCQs based on the concepts and techniques taught in the last four days of this Hands-on Training.

Prior to the test, the students performed some laboratory work; PCR of the Transformed Yeast culture was done, for which the transformation was done on 29 August 2023 under the supervision of Dr. Rohini Nair. After the test, the “Ideathon” competition started in which six groups and individuals were participated. In this competition, the students were presented their innovative ideas and thoughts on various aspects of biotechnology and science through power point presentation. The competition was judged by **Dr. Rajendra Kumar Jangde**, Assistant Professor, University Institute of Pharmacy, PRSU, and **Dr. Afaqur Quraishi**. Various brainstorming and creative ideas like Exploiting the anti-inflammatory properties of *Madhuca indica* (Mahua) for the treatment of Arthritis disease, Waste Diagnosis with Artificial Intelligence using mobile applications, Pharmacogenesis, Revolutionizing Biotechnology– Unlashing the power of mobile unit labs for farmers, Non-invasive glucometer, Oil spill remediation using nanobiocatalysts, etc., were presented by the students.

After completion of the competition, students were performed agarose gel electrophoresis of the PCR amplicons in view detect bands to determine the transformed and non-transformed yeast cultures. The gel was visualized under the Gel Doc system, and the analysed results were interpreted by the expert and explained to the students. At last, a Valedictory Function was organized in which position holders of the Ideathon were provided with *Certificate of Appreciation*. Students were provided their feedback regarding the overall training session. Thereafter, **Prof. Keshav Kant Sahu Sir** addressed the students, stating importance of this training session and, appreciated and congratulated the Alumni Association of Biotechnology

for organization and successful completion of this event, and assured the students that such types of events will be conducted frequently in coming future. After that, vote of thanks was extended by the coordinator of this program; **Dr. Nagendra Kumar Chandrawanshi Sir.**

Glimpses of the Day



(Dr. Nagendra Kumar Chandrawanshi)
Coordinator

Five Days Hands-on-Training cum Workshop

on

Advance Biotechnology Techniques

Genetic Engineering

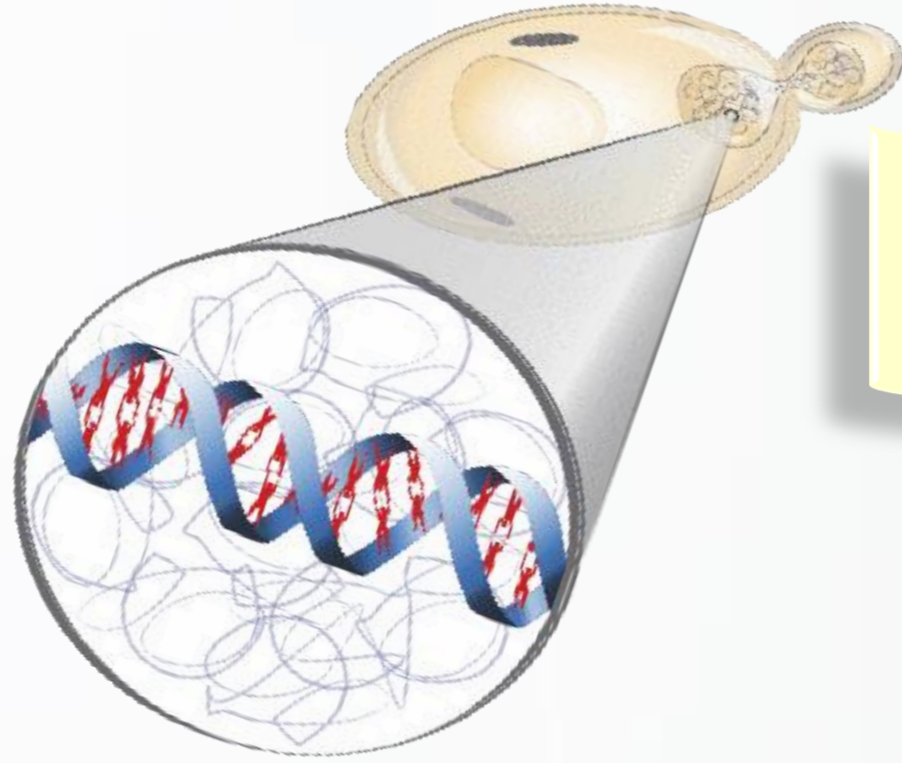
Immunology

Molecular Biology

Microbiology

&

Yeast Genome Engineering



25-29 August 2023
10:30 am onwards



Only 15 seats

First come,
first serve

Jointly Organized by

School of Studies in Biotechnology

Pt. Ravishankar Shukla University Raipur 492 010 CG

&

Alumni Association of Biotechnology

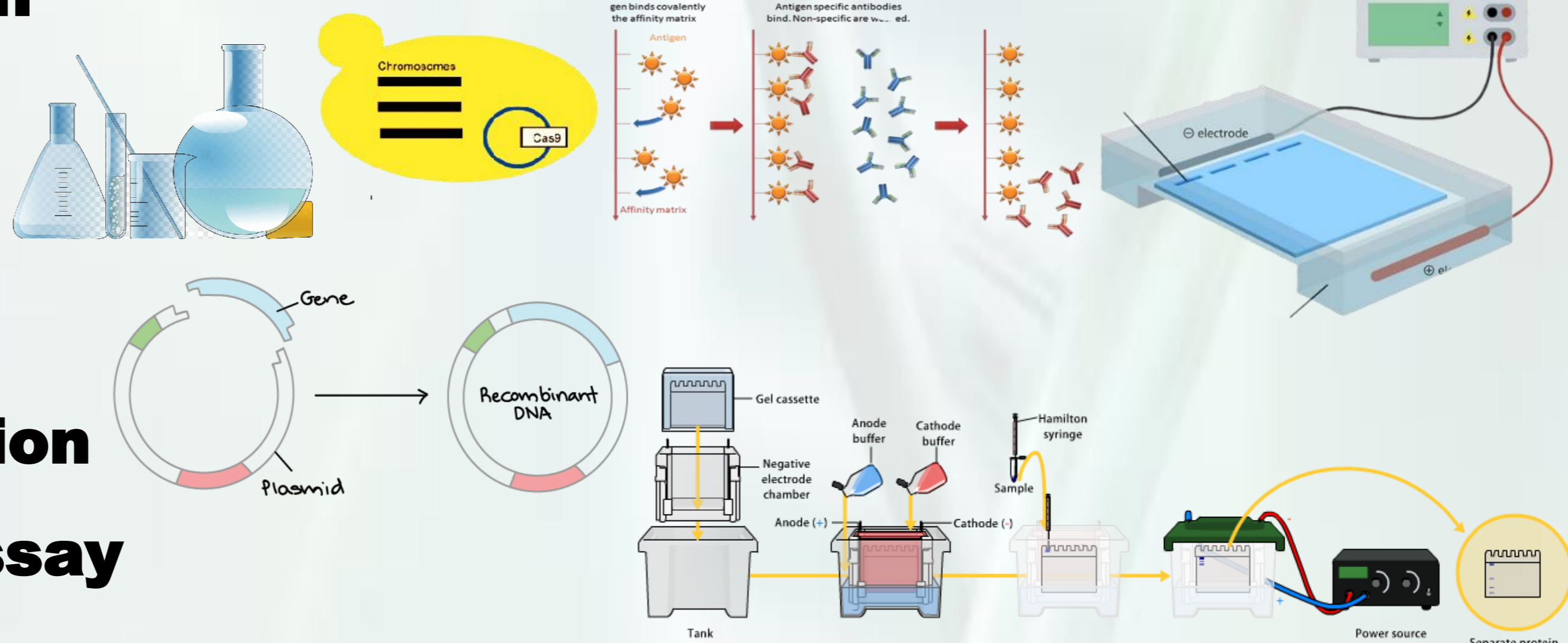
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HiMedia Laboratories Pvt. Ltd. Mumbai, Maharashtra

Theory and Hands-on

Instrumentation Techniques

- ✓ Reagent & media preparation
- ✓ Agarose gel electrophoresis
- ✓ SDS-PAGE
- ✓ Gel documentation
- ✓ Restriction digestion & ligation
- ✓ Qualitative & quantitative assay
- ✓ Yeast genome engineering
- ✓ Antibody purification



Experts



Dr. Rohini Nair
Faculty
Medical Biotechnology
Gujarat Biotechnology University
Gandhinagar, Gujarat



Dr. Mangesh Mankar
Product Expert
Molecular Biology
HiMedia Laboratories Pvt. Ltd.
Mumbai, Maharashtra

Coordinator: Dr. Nagendra Kumar Chandrawanshi

Scan and pay Fee: ₹ 500/-



For queries
6263537426



For registration

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Eligibility: Any student of Life Science can join