Workshop on

"Genome Engineering of Fungal and Yeast Strains for Biomolecule Production"

(5th -7th December 2018)

Jointly organized by

Biotechnology Industry Research Assistance Council (BIRAC)

DBT-ICGEB Advanced BioEnergy Research (CABeR) and

International Centre for Genetic Engineering & Biotechnology (ICGEB)

Venue

ICGEB Campus, Aruna Asaf Ali Marg, New Delhi

on

December 5th-7th, 2018

Deadline for receipt of applications: 30th Nov 2018

Coordinator:
Dr. Syed Shams Yazdani,
ICGEB, New Delhi

Registration Details

The application will be considered on first-come-first-serve basis. The interested participants have to send a requisition form along with curriculum vitae for attending the workshop through email to dbt.icgeb.bioenergy@gmail.com with the scanned copy of the duly filled and signed form attached, following which an acceptance email will be sent. Registration fee has to be paid after the acceptance.

Registration Fee:

for BIRAC funded organization	**Rs 5000**
Other organization	**Rs. 10000**

Payment Mode: E-Transfer/Demand Draft

Bank Details for electronic/ wire transfer:
Agency Name- **International Centre for Genetic Engineering and Biotechnology (ICGEB)**
Account No: **23077018**
Bank Name: **Bank of America**
Branch name: **Bank of America, Sansad Marg, 1st floor, New Delhi 11001**
Nature of Account: **Current**
IFSC Code: **BOFA0ND6216**

For Demand Draft: DD should be in the name of "ICGEB, New Delhi" payable at Delhi.

Please mention your name and remark "fee paid for BIRAC workshop" during online payment/wire transfer and write your name and contact number in case of DD.

Target Audience: Industrial R&D scientists/PhDs/Post Docs

*Accommodation will be provided on availability basis in near hotels/guest house. Participants are expected to pay the cost of their stay.

For details please contact**:**

Dr. Brajesh Barse,
Research Scientist/ Project Manager
DBT-ICGEB Centre for Advanced BioEnergy Research, ICGEB, New Delhi,
Email- dbt.icgeb.bioenergy@gmail.com,
Phone- 011-26742360 (Ext. 462)

Background

The training program will cover modern tools and techniques used in experimental research in the area of strain development and improvement for the production of biomolecules. This will cover in-depth genetic engineering approach which include DNA cloning, PCR, genome editing and enzyme assays.

The purpose of the training programme is **to upgrade skills and generate trained human resource in the related sector**. The Training will give an opportunity to have hands-on experience in genetic engineering paradigm for strain improvement and industrial biotechnology applications.
This training workshop is being organized as part of Industry mentoring of BIRAC in collaboration with DBT-ICGEB Centre for Advance BioEnergy Centre, ICGEB, New Delhi.

Objectives: Various molecules produced through biological sources have become need of an hour to save our environment from toxic and hazardous chemical processes. However, there is hardly any biomolecule produced naturally by the native organism that can meet the desired titer and productivity. Therefore strain development and improvement becomes a key subject for making the process economically viable at commercial level. This training program will provide theoretical and practical courses on strain development and improvement for biomolecule production. The topics to be covered are as follows:

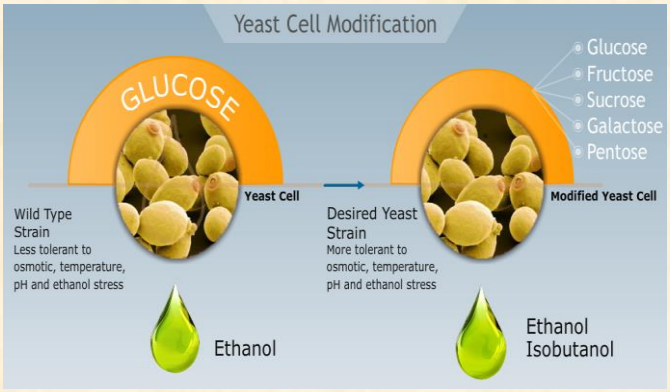
The training is to be divided into 2 categories each to be covered over a period of 3 days.

1. Fungal platform for enzyme production

- Selection of appropriate host for enzyme production
- Development of SOPs for enzyme assay
- Genome annotation and identification of targets for genome engineering
- Selection of appropriate vector and transformation tools
- Genome editing and molecular analysis of engineered strain
- Evaluation of enzyme titre

2. Yeast platform for biomolecule production

- Selection of appropriate host system for biomolecules production
- Synthetic biology application in metabolic pathway engineering for C5 utilization and FAEE production
- CRISPR-Cas9 and its application for biomolecule synthesis
- Evaluating the cost, activity, titre and productivity of biomolecule



Teaching methodology:

The training programme will include lectures, demonstrations, hands-on practices and discussions. A theoretical introduction to each topic will be followed by the practical module, which will entail the demonstration of the laboratory technique followed by its practical execution by the participants (wherever possible). The learning process will develop through direct contact with the laboratory experimental techniques and by the systematic execution of all the essential steps conducing to the successful completion of the experiment. Major interest on problem solving and practical skill development will be conducted during the workshop

Outcome

Intended Knowledge Outcomes

On completing this workshop participants should understand the day-to-day workings of a molecular biology laboratory. Participants will gain basic knowledge of synthetic biology techniques and specific knowledge of regulation of gene expression in yeast and fungi.

Intended Skill Outcomes

Participants will gain subject specific skills through basic experiments in molecular biology domain. The ability to carry out laboratory procedures correctly, accurately and precisely on an individual basis is promoted. Intellectual skills will be developed through relating laboratory methods to principles of molecular biology and through data interpretation and analysis. Participants will be able to assess where and why experiments have failed and be able to rectify procedures or protocols in such situations.

Program Agenda

DAY 1- Wednesday, 5th December 2018- Fungal platform for enzyme production		
9:00	Inauguration of the Workshop	**Dr. Dinakar M. Salunke** (Director, ICGEB)
9:15	Introduction about BIRAC	**Dr. Shilpi Gupta (BIRAC)**
10:00	**Introductory lecture** – Engineering fungal host improved enzyme production	**Dr. Syed Shams Yazdani** (ICGEB, New Delhi)
10:45	Tea/Coffee Break	
11:15	**Lecture** – Genome engineering of microbial system for biomolecule production	**Prof. K J Mukherjee** (Nagarjuna Ltd)
12:00	**Experimental session** • Selection of appropriate host for enzyme production	
13:00	Lunch	
14:00 – 18:00	**Experimental Session** • Development of SOPs for enzyme assay • Genome annotation and identification of targets for genome engineering	
DAY 2- Thursday, 6th December 2018 - Fungal platform for enzyme production		
9:30	**Lecture** – RNA based regulatory system for metabolic engineering	**Dr. Praveen Verma** (NIPGR)
10:30	Tea/Coffee Break	
11:00	**Lecture** – An industrial perspective of enzyme production from fungal platform	**Dr. Ashvini Shette** (Praj Industries Ltd, Pune)
12:00	**Experimental Session** - Selection of appropriate vector and transformation tools	
13:00	Lunch	

14:00-18:00	**Experimental Session** - Genome editing and molecular analysis of engineered strain - Evaluation of enzyme titre	
DAY 3 - Friday, 7th December 2018- Yeast platform for biomolecule production		
9:30	**Lecture** – Engineering yeast for of C5/C6 utilization and FAEE production	**Dr. Naseem Gaur** (ICGEB, New Delhi)
10:30	Tea/Coffee Break	
11:00	**Lecture** – Yeast engineering for terpenoid production	**Prof. Anand Bachawat** (IISER Mohali)
12:00	**Experimental Session** - Synthetic biology tools and techniques for yeast engineering	
13:00	Lunch	
14:00-17:00	**Experimental Session** - Optimization of regulatory network - CRISPR-Cas9 application	
17:00-18:00	Participants Feedback and Vote of thanks	