

Bioprospecting Laboratory

No# 315, ASK II.

Principal Investigator: Dr Kiran Babu Uppuluri

Laboratory Mission Statement

Our laboratory is aimed at generation of knowledge and intellectual manpower to develop novel therapeutically important molecules, greener fuels and technologies.



SASTRA
ENGINEERING · MANAGEMENT · LAW · SCIENCES · HUMANITIES · EDUCATION
DEEMED TO BE UNIVERSITY
(U/S 3 OF THE UGC ACT, 1956)

THINK MERIT | THINK TRANSPARENCY | THINK SASTRA



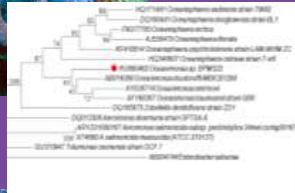
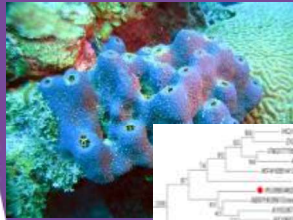
Laboratory Interest

Bioprospecting particularly involves in the bioprocess development of microbial metabolites that have potential applications in food, pharmaceutical and bioenergy sector.

Major research areas in focus

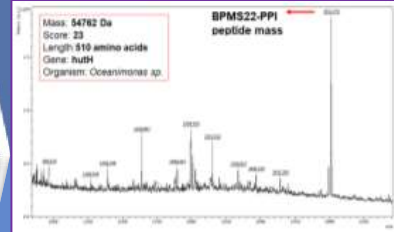
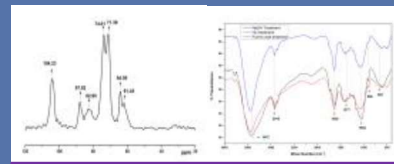
- 1. Bioprospecting of microbial enzymes and enzyme inhibitors.**
- 2. Production and applications of microbial polymers.**
- 3. Production, formulation and applications of nano bio-catalysts.**
- 4. Green synthesis polymeric metal nano particles for biomedical applications**
- 5. Consolidated Bioprocessing of 2G liquid biofuels**

Bio-prospecting of marine microbes



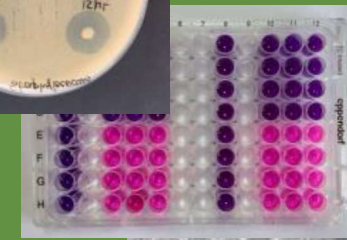
- Biodiversity of marine microbes
- Bioactive screening
- Functional screening

Characterization of the obtained biological products



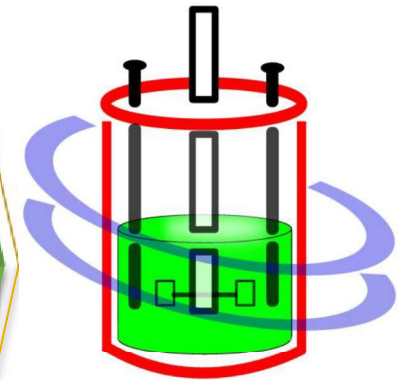
- Identification of biosynthetic genes
- Characterization of biological products
- Identification of regulatory proteins

Biological activity screening of the microbial outcome



- Molecular and modelling tools for biological systems
- Metabolic optimization of the hosts
- Animal studies

Bioprocess development and Technoeconomic analysis



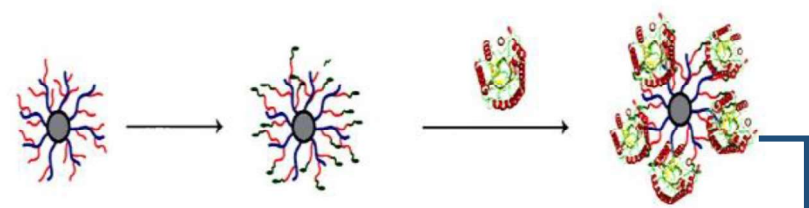
- Optimization of fermentation process
- Scale up to demonstration level
- Identification of markets and barriers for commercialization

Fusarium sp. EF1 GQ166777.1
Fusarium graminearum strain NSF3 KR611566.
Fusarium sp. strain Z10 MF973465.1
Fusarium sp. isolate SR607-LCJ278 KY238312.1
Fusarium sp. FW2PhC1 JX273060.1
Fusarium sp. 13002 EU710518.1
Geosmithia putterilii isolate A20 EU847656.1
Fusarium equiseti strain Salicorn 5 KJ413063.1
Fusarium oxysporum strain 150403-45 M07 LO NSLab1 KC354665.1
 ▲ *Fusarium* sp. F-D GU980962.1
Fusarium sp. 14201 EU710822.1
Fusarium sp. LNUF014 HM067111.1
Fusarium oxysporum strain NSF2 KR611565.1
Fusarium equiseti strain 086 MF072591.1
Fusarium culmorum isolate Pz KY780172.1
Fusarium venenatum XR 003150050.1
Fusarium sp. MI 17 AB245442.1

Bioprospecting of indigenous fungi



Production of cellulolytic enzymes



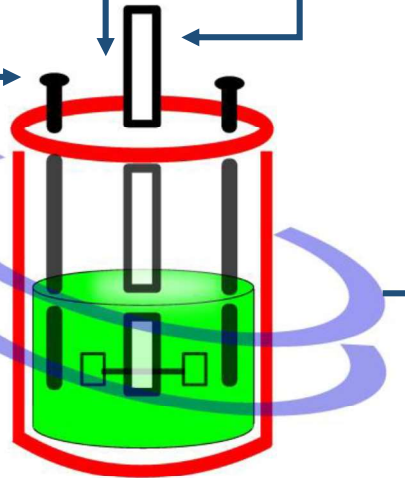
Partial purification and formulation of nano-cellulolytic enzymes



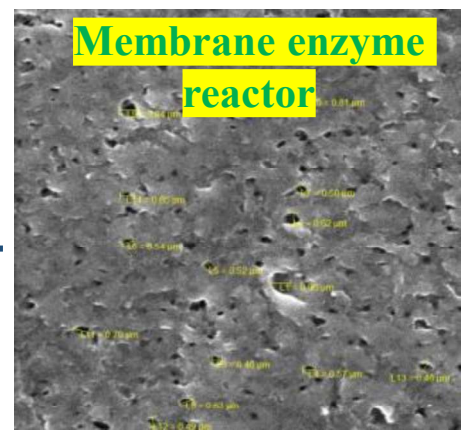
2G Biomass, Pre-treatment with organic acids



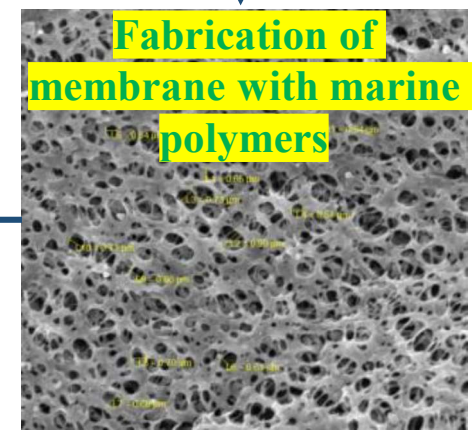
Inoculum



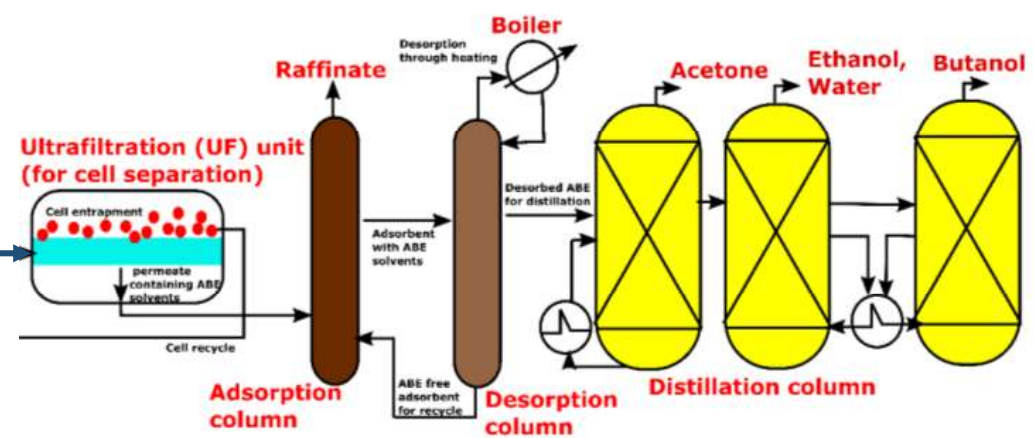
Simultaneous saccharification and fermentation



Membrane enzyme reactor



Fabrication of membrane with marine polymers



Recovery of liquid biofuels by adsorption using lignin



Significant Achievements during 2015-21

- 32 International research publications with ~1355 cumulative Impact factor and Six Book chapters were published.
- Three Sponsored research projects from DST & DBT were executed for a totaling amount of Rs. 102 lakhs.
- Presently, a SERB/DST project has been executing in the area for biorefinery of 2G biomass & biofuels
- One PhD was produced and 16 post graduated and 30 undergraduate projects were executed in the area of Bioprocess Technology and Pharmaceutical technology during last five years (till 2021).
- Two national workshops on “Bioprocessing strategies for Biofuels” were organized with the financial support of , SASTRA, DST & DBT during 2017 & 2019.