THAKUR BIOLOGICAL

Gat No.204, A/P Solu, Tal-Khed, Dist-Pune
Mob:9850389279/8796402292

Date: 22/11/2018

To,

Dr. Preety Singh. Mr. Anand Khandwekar, Dr. Aiswarya Dash, Dr. Biswaprasun Chatterji
Assistant Professor
School of Engineering,
Ajeenkya D Y Patil University
D Y Patil Knowledge City
Charholi Budruk, Via Lohegaon
Pune 412 105, Maharashtra, India

Dear Ma'am,

Subject: Acceptance of Proposal f**or Recycling of fermented waste cellular biomass as a substrate for solid-state fermentation to produce cellulase enzyme – One-Year Duration**

I hope this message finds you well. After careful review, I am pleased to inform you that we have accepted your proposal for Recycling of fermented waste cellular biomass as a substrate for solid-state fermentation to produce cellular enzymes with a duration of one year, and granted 31 Lakhs Rs.

We greatly appreciate the effort and detail that went into your proposal, and we are confident that this collaboration will bring significant value to both parties. Our team is enthusiastic about the opportunity to work together and achieve the following outlined proposal and objectives over the next one years:

Cellulase is a catalytic powerhouse for valorization of lignocellulosic waste complex comprising CBH, EG, and BGL components, hence, hydrolyses synergistically to convert crystalline cellulose to glucose. Even though commercial cellulase production is carried out by fungal submerged fermentation, solid state fermentation (SSF) can also be used alternately to produce cellulase enzyme complex. As SSF is performed in the absence of free water, it is observed to be more appropriate for filamentous fungi, as it has minimum energy consumption, higher enzymes titre, higher productivity, lower sterilization demand, lower downstream processing cost and mimics the natural habitats of microbes. The overall cellulase enzyme activity may be limited from a single source which can be overcome by culturing the two

cellulase producers together called co-culture model. The hyper-production of cellulase enzyme can be obtained with using co-cultures of two fungal cellulase producers.

Among the fungi, cellulase enzymes are mostly produced by sporulating filamentous fungi. The two cellulase producers are to be plated and slanted for 7-8 days to produce spores which are harvested using sterile isotonic solution of NaCl containing 0.5% of Tween 80. Upon gentle scraping the spores can be collected, and the spore suspension is to be stored at 4℃ to use as inoculum. The inoculum level of consortium microbes is then optimized and used to hyper-produce the cellulase enzyme. The adaptation study of co culture spores is to be carried out to avoid the antagonist effect on each other. The sterilized fermented cellular biomass is recycled as the main substrate along with the other micronutrients to produce cellular enzymes by solid state fermentation. The cellular biomass is composed of the polymeric components which the nutrient medium and physicochemical parameters would be then optimized with design of experiments followed by validation and scale up.

2. Objectives

• To assess and validate the various sterilized fermented waste cellular biomass as substrate for cellulase production under solid-state fermentation (SSF).
• Adaptation of the cellulase producers for co-culture technique in SSF.
• To optimize the medium along with fermented cellular biomass for hyper production of the cellulase enzyme.

We look forward to discussing the next steps, including any necessary contractual agreements and the project timeline. Please do not hesitate to reach out to coordinate these matters, or should you require any further information from us.

Thank you once again for your proposal. We are excited about this partnership and are confident that it will lead to mutual success.

Sincerely,
Thakur Biological, Pune