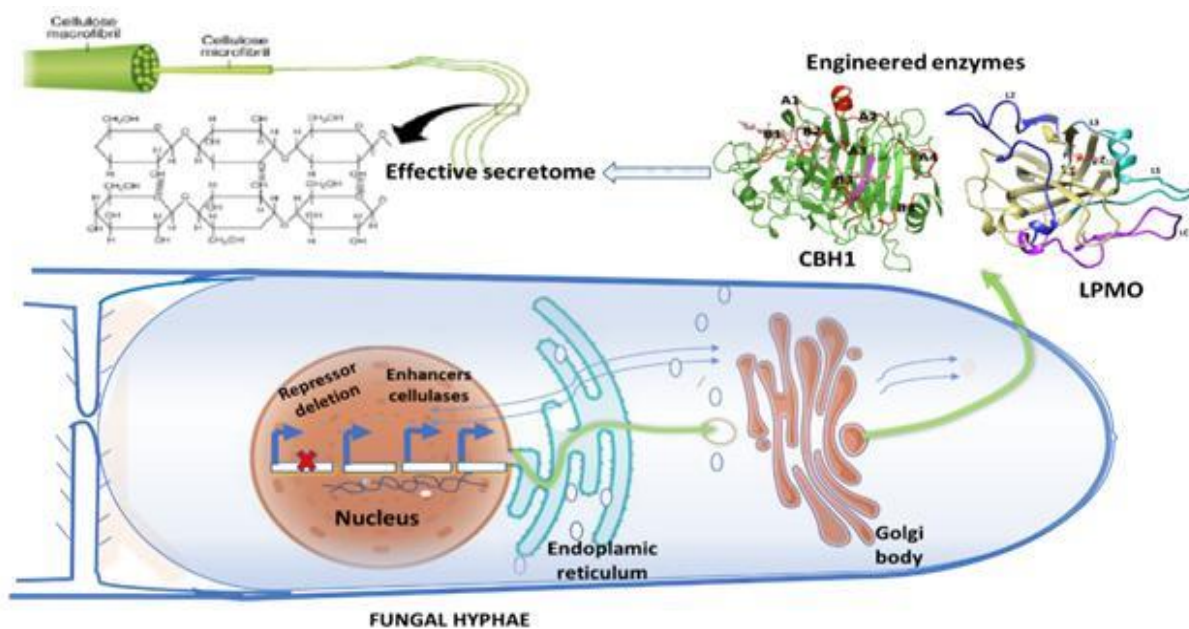


## DBT-ICGEB Bioenergy Centre Enzyme Technology: Overview

The DBT's International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi's Centre for Advanced Bioenergy Research is an integrated centre for performing cutting-edge basic research and its translation into reality. It thrives upon ICGEB mandate to perform research in the field of molecular biology and biotechnology and serves as platform for the synthetic biologists to work in diverse bio-energy areas such as microbial engineering, biochemical engineering, algal engineering and systems biology.

The Centre made a major leap in cellulosic enzyme development for 2G ethanol. Via its robotic high-throughput technology platform and using its unique mathematical model-based screening approach, a hypercellulolytic strain of fungi was isolated for cellulase enzyme preparation for 2G-ethanol production. Synthetic biology and Omics approaches were further implemented to genetically engineer the Fungal genome to produce higher quantity of more effective cellulase enzyme.



This genetic engineering led to reduced repression in enzyme production and improved content of most crucial cellulases in the enzyme preparation. Higher efficiency and superior recycling ability of this in-house developed fungal enzyme preparation were found as compared to commercial enzymes for hydrolysis of pre-treated biomass. This technology has been verified

and validated by other Centres. Intellectual properties for this technology have been protected and patent has been granted in various countries, including USA and China. The technology is in the process of being scaled-up to 500L and then to 5000L scale in near future. The cellulase enzyme preparation developed at DBT-ICGEB Centre will be available to 2G-ethanol commercial plant in India as well as abroad.

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