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ICGEB-DBT Bioenergy Research Team got US patent granted for cellulase preparation

Scientists at International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi have made a big stride in the world of biofuels by obtaining a US patent award for discovery of a new cellulase preparation. The discovery is likely to provide a better alternative to commercial cellulase enzyme available in market that produce ethanol for second generation (G2) biofuel. The G2 biofuels are fuels developed from non-food biomass such as sugar cane bagasse, sunflower stocks, press cakes, nutshells, etc.

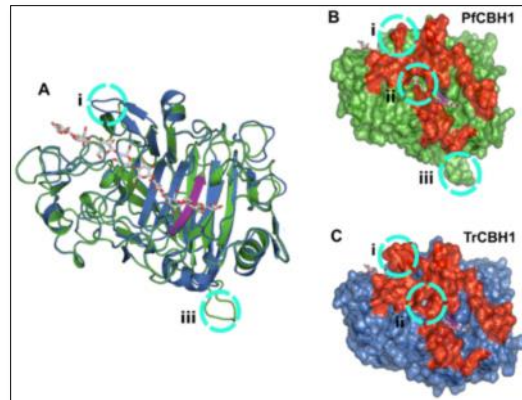


Dr. Syed Shams Yazdani with his team at ICGEB

The Microbial Engineering Group led by Dr. Syed Shams Yazdani at ICGEB has discovered as a cocktail of enzymes that have balanced cellulase and hemicellulase activity that can break down the agricultural biomass into simple sugars with high efficiency.

Dr. Syed Shams Yazdani has done his master's degree and doctorate from Ph.D. from Jawaharlal Nehru University, New Delhi. Since 2000, Dr. Yazdani has been teaching metabolic engineering, large-scale production and purification of gene products, microbial genome editing and engineering among other significant microbiological studies. He is interested in studying non-food-based feedstock for biofuel production, and biomass burning issue. He has published large number of research articles in high impact peer review national and international journals.

The fungal isolate, *Penicillium funiculosum* produced both as cellulases and hemicellulases in large amounts in extracellular medium. Both enzymes were found to be active against wide variety of agriculture residues such as rice straw, wheat straw, sugarcane bagasse, cotton stalk, etc. The enzymatic activity resulted in production of simple sugars which were further metabolized to ethanol, a second generation (2G) biofuel.



Structural feature of cellulase of *Penicillium funiculosum* (Pf) and its comparison with that of *Trichoderma reesei* (Tr)

Dr. Yazdani's discovery will provide a feasible enzyme option in the market and will help in overcoming limited availability of commercial cellulase enzymes in 2G biofuel market. Dr. Yazdani and his research team have successfully carried out genomics, proteomics and biochemical characterization of the enzyme preparation to show its efficiency as compared to available enzymes.

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