Role of hydrolytic enzymes cellulase and xylanase in second generation biofuel production

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Abstract:

Nonrenewable fossil fuels and their serious environmental impact have forced to develop renewable and sustainable energy sources. In this scenario, hydrolytic enzymes have found extensive applications in the biofuel industries. Application of microbial enzymes for pretreatment of lignocellulosic material is currently earning a huge attention of the industry. This is a result of growing interest about depletion of fossil fuel resources in the world which have inspired the production of bioethanol from lignocellulosic biomass through enzymatic hydrolysis. Lignocellulosic biomass is one of the best options as a low-cost, readily available and eco-friendly raw material. Cellulose is forming lignocellulose in combination with hemicellulose and lignin which finally becomes a compact network structure. Moreover, it has a crystalline structure which is hard to break down as well as insoluble in water and causes limitations in hydrolysis. Pre-treatment of lignocellulose is a prerequisite step carried out to increase the surface area of the feed stock, remove barriers made by lignin, to increase porosity of cellulose and to release the sugars from cellulose and hemicellulose by enzymatic hydrolysis During pretreatment, it will loosen up the crystalline structure and facilitate the degradability to release fermentable sugar forms.

Another practical use for these in silico methods is to predict the interaction of the receptors and their potential ligands (including both co-enzymes, or substrates. In this regard, examples include predicting the substrates and co-enzymes for Alcohol Dehydrogenase from Cyanobacterium Synechocystis sp.

Biography:

Nivedita Sharma was born on June 9, 1964 in Mandi, India. Daughter of Somesh Chand and Chanderkanta Sharma. Currently she works as a Professor at the Department of Basic Sciences, Dr. Yashwant Singh Parmar University of Horticulture and Forestry. Nivedita Sharma does research in Molecular Biology, Biotechnology and Microbiology. Her current interests are in Biofuels, Enzymes , Probiotics and functional foods.She has been listed as a noteworthy microbiologist, researcher, educator by Marquis Who's Who.Her bachelor of Science, H.P. University Shimla, India in 1983, Master of Science, H.P. University Shimla, India in 1985, Master of Philosophy in Microbiology, H.P. University Shimla, India in1987 and Doctor of Philosophy in Microbiology, H.P. University Shimla, India in 1991.Her avocations are reading, listening to music, gardening, traveling, nature.She was a member of Association Microbiology India, GBF Club.

Publication of speakers:

1. Sharma, Nivedita & Bansal, Kishori & Neopaney, Bhanu. (2018). Enhanced biodegradation of forest waste under solid state fermentation by using a new modified technique.

2. Sharma, Nivedita & A, Sood. (2018). Biodegradation of agricultural residue by Bacillus sp. Strain CBS28 and CBS11 isolated from soil.

3. Sharma, Nivedita & Bhalla, Tek. (2018). Bacteria from forest litter.

4. Sharma, Nivedita & Joshi, Vinod. (2018). Spoilage of fruits, vegetables and their processed products.

5. Sharma, Nivedita. (2018). Industrial Ethanol Production In: Biotechnology Food Fermentation.