OMICS Group Conferences
Accelerating Scientific Discovery

Global Biofuels & Bioproducts Summit

November 19-21, 2012 Hilton San Antonio Airport, USA

Producing wide rang substrate xylanase by constructing chimeric recombinant protein with endo and exo- xylanase activity

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Hemicellulase, a heterogeneous polysaccharide in plant and some microorganism cell wall, is the second most abundant organic biopolymer in nature. Two members of Glycoside hydrolases family including Endo-xylanase (EC.3.2.1.8) and exo-xylanase (EC.3.2.1.37) with accessory enzymes like α-L-arabinofuranosidase, α-glucoronidase and several other enzymes cooperate together to biodegrade xylan polymers of this lignocellulosic component of the cell wall. Biosynthesis of chimeric polypeptides with ability to catalyzing more than one enzymatic reaction is an effective way to increase enzymatic substrate range with reducing costs and time in biotechnological projects. Here, microbial Xylosidase from *Selenomonas ruminantium* have been fused to microbial xylanase *Thermobacillus xylanilyticus* via flexible peptide linker fragment and final construct has transformed to yeast *Pichia pastoris*. It has been expressed and its enzymatic and kinetic properties have been characterized. This xylanase-xylosidase engineered protein has both xylanase and xylosidase activity like parental mixed enzymes. Results demonstrated that construction of components with dual function is feasible and useful for reducing costs of bioconversion of xylan polymers to xylose monomers. Moreover, data showed this chimer protein can degrade wide range of substrates.

Biography

Ehsan Dehnavi is a PhD student of Biochemistry in Tarbiat Modares University. He is currently spending his PhD thesis project, under supervision of Dr. Khosro Khajeh and Dr. Seyed Omid Ranaei Siadat. Briefly, his thesis could be categorized in two fields, expression of Recombinant microbial xylosidase in pichia pastoris and protein engineering.

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