THE MOST ACTIVE CATALYST IN CONVERTING XYLOOLIGOSACCHARIDES TO XYLOSE FOR FERMENTATION TO ETHANOL AND OTHER BIOPRODUCTS

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β-D-Xylosidase/α-L-arabinofuranosidase from *Selenomonas ruminantium* (SXA) is the best catalyst known for promoting the hydrolysis of 1,4-β-xylooligosaccharides. Xylooligosaccharides are linear linkages of 2-10 xylose residues. By having tenfold better activity than other enzymes in hydrolyzing xylooligosaccharide substrates, bifunctionality of β-xylosidase and α-arabinofuranosidase activities, and good thermal and pH stabilities, SXA has potential utility in industrial processes for saccharification of herbaceous biomass (arabinoxylan fraction) to simple sugars that can be fermented to ethanol and other bioproducts. The enzyme can be used in combination with the activities of xylanases, which catalyze hydrolysis of long polymers of xylose (xylan, a major component of hemicellulose and one of the most abundant biopolymers) to smaller xylooligosaccharides, and other enzymes, which catalyze hydrolysis of acid and sugar substitutions to xylose that can occur in xylan. Also, the enzyme can be used to convert xylooligosaccharides remaining in biomass following nonenzymatic hydrolysis processes (physiochemical treatments) to increase conversion efficiency. We have filed patent applications on this technology.

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