

152b Enzymatic Extraction of Ferulic Acid from Agriculture Waste for High-Valued Products

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More than 5 million tons of corn fibers are generated each year from wet-milling and dry-grinding ethanol plants in North America (1). Corn fibers contain approximately 3% ferulic acid, a precursor for vanillin. Thus the agriculture waste stream is a potential source of raw material for high-valued natural flavor compound, vanillin. As ferulic acid in corn fiber is ester bonded to xylan polysaccharide chains, a feruloyl esterase is needed to efficiently recover ferulic acid from the agriculture waste stream. We developed an enzyme screening protocol, which has resulted in the discovery of several novel fungal and bacterial feruloyl esterases. A few such enzymes, when used with other hemicellulases, can liberate 100% of ferulic acid contained in corn fiber. In this presentation, we discuss the details of our enzyme discovery, purification, characterization, and cloning, and their application in the enzymatic extraction of ferulic acid from corn fibers that are generated from a modified dry-grinding process.

(1): Hicks et al, Potential new uses for corn fiber, Proceedings of the corn utilization & Technology Conference, Kansas City, MO, June 3-5, 2002.