

# Development of a Surface-Engineered Yeast Codisplaying Amylolytic and Cellulolytic Enzymes for the Purpose of Ethanol Production from Cassava Pulp

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## Abstract

Cassava is one of the major crops in the Southeast Asia and mainly used for starch production. During starch manufacturing large amounts of solid waste, called cassava pulp, is produced. It contains abundant starch (approximately 60%) and cellulose fiber (approximately 20%). We are working on the development of fuel ethanol from the cassava pulp using the so-called arming technology. So far we have developed a yeast codisplaying  $\alpha$ -amylase (AmyA), glucoamylase (GLAR), endoglucanase (EGII), cellobiohydase (CBHII), and  $\beta$ -glucosidase (BGLI) on its surface. The surface-engineered arming yeast was able to hydrolyze and ferment starch and cellulose fiber in the cassava pulp and produce ethanol without addition of any enzymes.

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