

Biocatalytic production of D-allose and D-psicose from fructose

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Sugar is essential to maintain living body thorough producing energy. However excess ingestion of sugar lead to problems including obesity and diabetes. There are alternative natural sweetners such as D-allose, D-psicose, and D-tagatase to reduce these problems. We attempted to isolate and apply for efficient production of D-allose and D-psicose using biocatalytic conversion. Therefore, enzymes and their D-allose production are compared and suggested here. We showed the thermostable position selective sugar epimerase and isomerase produced D-allose via D-psicose from fructose by purified enzyme, recombinant cell, and immobilization. Furthermore, selectivity and activity of enzyme were increased by protein engineering tool such as mutagenesis based on computational modeling and crystal structure. Our result will provide extende chance to efficient utilization of biocatalyst for production of value added sugar product because D-allose and D-psicose possessed many pharmaceutical activities.