1,5-Anhydro-D-fructose: biocatalytic and chemical synthetic methods for the preparation, transformation and derivatization.

1,5-Anhydro-D-fructose (1,5AnFru) is a monoketosaccharide that can be prepared enzymatically from starch by α-1,4-glucan lyase or chemically from D-glucose or D-fructose in a few steps with high yields. The formed 1,5AnFru can be derivatized both enzymatically and chemically to interesting new carbohydrate derivatives, some with biological activities. For example dehydratases, isomerases and reductases can convert 1,5AnFru to enolones (as Ascopyrone P) and sugar alcohols with antimicrobial and antioxidant properties, while chemical modifications can give similar compounds as well as natural products like 1-deoxymannonojirimycin and Clavulazine. 1,5AnFru disaccharides (glycosyl 1?4 1,5-anhydro-D-tagatose) have been prepared as well as glycosyl 1?4 1,5-anhydro-D-tagatose.

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