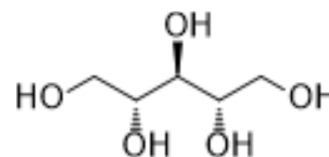


## Ribitol

Cat. No.:	HY-100582		
CAS No.:	488-81-3		
Molecular Formula:	C <sub>5</sub> H <sub>12</sub> O <sub>5</sub>		
Molecular Weight:	152.15		
Target:	Endogenous Metabolite		
Pathway:	Metabolic Enzyme/Protease		
Storage:	Powder	-20°C	3 years
		4°C	2 years
	In solvent	-80°C	2 years
		-20°C	1 year



### SOLVENT & SOLUBILITY

#### In Vitro

H<sub>2</sub>O : 33.33 mg/mL (219.06 mM; Need ultrasonic)  
 DMSO : 1.1 mg/mL (7.23 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	6.5725 mL	32.8623 mL	65.7246 mL
	5 mM	1.3145 mL	6.5725 mL	13.1449 mL
	10 mM	0.6572 mL	3.2862 mL	6.5725 mL

Please refer to the solubility information to select the appropriate solvent.

### BIOLOGICAL ACTIVITY

#### Description

Ribitol is a crystalline pentose alcohol formed by the reduction of ribose. Enhancing the flux of D-glucose to the pentose phosphate pathway in *Saccharomyces cerevisiae* for the production of D-ribose and ribitol.

#### IC<sub>50</sub> & Target

Human Endogenous Metabolite	Microbial Metabolite
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#### In Vitro

Ribitol is a reduced sugar<sup>[1]</sup>. Phosphoglucose isomerase-deficient (pgi1) strains of *Saccharomyces cerevisiae* are studied for the production of D-ribose and Ribitol from D-glucose via the intermediates of the pentose phosphate pathway. Overexpression of the gene encoding sugar phosphate phosphatase (DOG1) of *S. cerevisiae* is needed for the production of D-ribose and Ribitol. The engineered strains are compared for their ability to produce the PPP-derived 5-carbon compounds Ribitol and D-ribose from D-glucose<sup>[2]</sup>.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## PROTOCOL

### Kinase Assay [2]

The high-performance liquid chromatography (HPLC) analyses are carried out using a Fast Acid Column (100×7.8 mm) and a HPX-87H Ion Exclusion Column (300 mm×7.8 mm) in series with 2.5 mM H<sub>2</sub>SO<sub>4</sub> in water as the mobile phase at a flow rate of 0.3 mL/min, at 55°C. This method enabled quantification of D-glucose, ethanol, glycerol, D-xylulose, Ribitol, and xylitol. D-ribose, D-ribulose, and D-arabitol coeluted on the Aminex HPX-87H column. The CarboPac MA-1 column of Dionex ICS-3000 is used to analyze representative culture supernatant samples for the presence of arabitol and xylitol. Samples are run at column temperature of 30°C with 480 mM NaOH at flow rate 0.4 mL/min. The CarboPac MA-1 column separated D-arabitol from D-ribose and D-ribulose, but the alkaline conditions degraded D-ribulose interfering with the quantification of D-ribose. Yeast cells are disrupted with glass beads in 100 mM sodium phosphate buffer pH 7.0 containing phenylmethylsulfonyl fluoride and pepstatin A in final concentrations of 0.17 mg/mL and 0.01 mg/mL, respectively. The activity of NAD<sup>+</sup>-dependent Gdh2p is measured in a reaction buffer of 0.5 M triethanol amine pH 7.7 and 2 mM NADH. After addition of the cell lysate, the reaction is started by adding a mixture of α-ketoglutarate (100 mM) and NH<sub>4</sub>Cl (200 mM) to a final concentration of 2.4 mM and 4.9 mM, respectively. The GapB activity is measured. Shortly, the reaction mixture is 500 mM triethanol amine pH 7.8, 1 mM ATP, 2 mM MgCl<sub>2</sub>, 200 μM NADPH, and 10 μg/mL of phosphoglycerate kinase. 3-phosphoglycerate is added to a final concentration of 5 mM to start the reaction. Activity measurements are performed with a Cobas Mira Plus automated analyzer<sup>[2]</sup>.

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## CUSTOMER VALIDATION

- Cell Rep. 2019 May 21;27(8):2480-2492.e6.

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## REFERENCES

[1]. Praissman JL, et al. The functional O-mannose glycan on α-dystroglycan contains a phospho-Ribitol primed for matriglycan addition. *Elife*. 2016 Apr 29;5. pii: e14473.

[2]. Toivari MH, et al. Enhancing the flux of D-glucose to the pentose phosphate pathway in *Saccharomyces cerevisiae* for the production of D-ribose and ribitol. *Appl Microbiol Biotechnol*. 2010 Jan;85(3):731-9.

**Caution: Product has not been fully validated for medical applications. For research use only.**

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