

Glucose-6-phosphate dehydrogenase

Chemical Properties

CAS No. : 9001-40-5

Formula:

Molecular Weight:

Store at low temperature

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Actual storage temperature shall be subject to the COA.

Biological Description

Description	Glucose-6-phosphate dehydrogenase is a rate-controlling enzyme of the pentose phosphate pathway (PPP) that catalyzes the oxidative dehydrogenation of glucose-6-phosphate to produce glucose-6-phosphate and NADPH. It is a sex-linked metabolic enzyme involved in the shunting of hexose monophosphate.
Targets(IC50)	Endogenous Metabolite, TLR
In vitro	<p>Methods: Glucose-6-phosphate dehydrogenase (G6PD) was extracted from the liver of <i>Pelteobagrus fulvidraco</i> and purified using affinity chromatography. The Michaelis constant (K_m) and maximum reaction velocity (V_{max}) of G6PD for the substrate glucose-6-phosphate (G6P) and the coenzyme $NADP^+$ were determined.</p> <p>Results: Kinetic parameters showed that the K_m value of G6PD for G6P was 0.479 mM, the K_m for $NADP^+$ was 0.029 mM, and the V_{max} was 2.83 U/ml [1].</p> <p>Methods: Different concentrations of metal ions (Cu^{2+}, Al^{3+}, Zn^{2+}, and Cd^{2+}) were added to the G6PD enzymatic reaction system. The enzymatic activities under various concentrations were measured, with the activity of the group without metal ion treatment set as the 100% reference value.</p> <p>Results: Based on the experimental data, the IC_{50} values of G6PD under Cu^{2+}, Al^{3+}, Zn^{2+}, and Cd^{2+} treatment were 1.718 mM, 1.299 mM, 0.321 mM, and 0.606 mM, respectively. Additionally, copper and aluminum ions exhibited competitive inhibition, with K_i values of 0.175 mM and 0.056 mM, respectively. Zinc and cadmium ions exhibited linear mixed-type inhibition; the K_{is} and K_{ii} values for zinc were 0.002 mM and 0.216 mM, respectively, while those for cadmium were 0.186 mM and 3.466 mM [1].</p> <p>Methods: Cellular validation: Due to the lack of a stable cell line for <i>Pelteobagrus fulvidraco</i>, an ovary cell line (CCO) from <i>Ictalurus punctatus</i>, a closely related species in the order Siluriformes, was used to analyze the effects of metal ions on G6PD mRNA expression and enzymatic activity.</p> <p>Results: Under low concentrations of metal ion treatment, both the mRNA expression and enzymatic activity of G6PD increased, whereas they significantly decreased under high concentrations, indicating a dose-dependent biphasic effect of metal ions on G6PD [1].</p>

Solubility Information

A DRUG SCREENING EXPERT

Solubility	H2O: 50 mg/mL, Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
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Reference

Sun, L., Sun, B., Zhang, Y. et al. Kinetic properties of glucose 6-phosphate dehydrogenase and inhibition effects of several metal ions on enzymatic activity in vitro and cells. Sci Rep 14, 5806 (2024).

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