

3-Deoxyglucosone

Chemical Properties

CAS No. : 4084-27-9

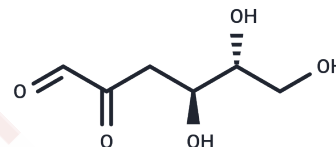
Formula: C₆H₁₀O₅

Molecular Weight: 162.14

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	3-Deoxyglucosone(3-Deoxy-D-glucosone) is synthesized by the intermediate pathway of the melad and polyol reactions.3-Deoxyglucosone reacts rapidly with protein amino groups to form advanced glycosylated end proteins (AGEs).3-Deoxyglucosone inactivates glutathione peroxidase and synergizes with low glucose to enhance GLP-1 secretion.3-Deoxyglucosone is used as a biomarker for diabetes mellitus.3-Deoxyglucosone has been shown to be an inhibitor of GLP-1 secretion in the presence of low glucose. 3-Deoxyglucosone inactivates glutathione oxidase, synergizes with low glucose to enhance GLP-1 secretion, and can be used as a biologic marker for diabetes.
Targets(IC50)	Glucagon Receptor,GPX
In vitro	3-Deoxyglucosone (80 ng/ml-1000 ng/ml; 1 hour; STC-1 cells) induces a 1.23-fold increase in GLP-1 secretion at 300 ng/ml and 1000 ng/ml, while 80 ng/ml shows no effect. At 300 ng/ml, 3DG significantly elevates intracellular Ca ²⁺ levels, as measured by Fluo-3/AM (2.5 μM for 30 mins), but does not affect intracellular cAMP in a cAMP Elisa assay. Additionally, 300 ng/ml 3DG significantly enhances TAS1R2, TAS1R3, and TRPM5 protein expression under both glucose-free and high conditions.[1]
In vivo	3-Deoxyglucosone (20 mg/kg; intragastric administration; single dose) induces a deterioration in glucose tolerance, as evidenced by an increased Area Under the Curve (AUC). Plasma glucagon levels do not show significant differences. The administration of 3-Deoxyglucosone leads to the development of impaired glucose regulation (IGR) accompanied by evident dysfunction of pancreatic islet cells in both Kunming mice and SD rats.[2] 3-deoxyglucosone (5-50 mg/kg; gastric gavage; once daily; 2 weeks; SD rats) exhibits significant increases in the upper small intestine (1.4-fold), lower small intestine (1.4-fold), ileum (1.4-fold), and colon (two-fold) compared to basal levels in their respective control groups. Additionally, there is a noteworthy decrease in the protein expressions of TAS1R2, TAS1R3, and TRPM5 observed in both the duodenum and colon.[3]
Cell Research	Cell Line: STC-1 cells. Concentration: 300?ng/ml. Incubation Time: 1 hour [1]
Animal Research	Animal Model: SD rats. Dosage: 5, 20 and 50 mg/kg. Administration: oral administration; once daily; 2 weeks [3]

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	6.1675 mL	30.8375 mL	61.6751 mL
5 mM	1.2335 mL	6.1675 mL	12.335 mL
10 mM	0.6168 mL	3.0838 mL	6.1675 mL
50 mM	0.1234 mL	0.6168 mL	1.2335 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Song X, et al. 3-Deoxyglucosone Induces Glucagon-Like Peptide-1 Secretion from STC-1 Cells via Upregulating Sweet Taste Receptor Expression under Basal Conditions. *Int J Endocrinol*. 2019 Oct 23;2019:4959646.

Wang F, et al. Acute Reduction of Incretin Effect and Glucose Intolerance in Rats by Single Intra-gastric Administration of 3-deoxyglucosone. *Exp Clin Endocrinol Diabetes*. 2017 Jan;125(1):4-11.

Zhang L, et al. Accumulation of intestinal tissue 3-deoxyglucosone attenuated GLP-1 secretion and its insulinotropic effect in rats. *Diabetol Metab Syndr*. 2016 Nov 29;8:78.

Niwa T, et al. 3-Deoxyglucosone: metabolism, analysis, biological activity, and clinical implication. *J Chromatogr B Biomed Sci Appl*. 1999 Aug 6;731(1):23-36.

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Tel:781-999-4286 E_mail:info@targetmol.com Address:34 Washington Street,Wellesley Hills,MA 02481