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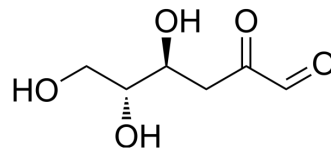
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3-Deoxyglucosone

Cat. No.:	HY-N7426
CAS No.:	4084-27-9
Molecular Formula:	C ₆ H ₁₀ O ₅
Molecular Weight:	162.14
Target:	GLP Receptor
Pathway:	GPCR/G Protein
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	3-Deoxyglucosone (3-Deoxy-D-glucosone) is a reactive intermediate of the Maillard reaction and the polyol pathway. 3-Deoxyglucosone rapidly reacts with protein amino groups to form advanced glycation end products (AGEs), such as imidazolone, it is the most specific AGE for 3-DG. 3-Deoxyglucosone synergizes with low glucose to potentiate GLP-1 secretion and is considered as a biomarker for diabetes ^{[1][2][3]} .								
In Vitro	<p>3-Deoxyglucosone (80 ng/ml-1000 ng/ml; 1 hour) markedly increases GLP-1 secretion by 1.23-folds in 300 ng/ml or 1000 ng/ml 3DG-treated group. But at a lower concentration (80 ng/ml) has no effects^[1].</p> <p>3-Deoxyglucosone (300 ng/ml; 1 hour) dramatically increases intracellular Ca²⁺ levels by Fluo-3/AM determination (2.5 μM for 30 mins). But 3DG does not affect intracellular cAMP levels in a cAMP Elisa assay^[1].</p> <p>3-Deoxyglucosone (300 ng/ml; 1 hour) significantly increases the protein expression levels of TAS1R2, TAS1R3, and TRPM5 under both glucose-free and high conditions^[1].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <p>Western Blot Analysis^[1]</p> <table border="1"> <tr> <td>Cell Line:</td> <td>STC-1 cells</td> </tr> <tr> <td>Concentration:</td> <td>300 ng/ml</td> </tr> <tr> <td>Incubation Time:</td> <td>1 hour</td> </tr> <tr> <td>Result:</td> <td>Upregulated TAS1R2, TAS1R3, and TRPM5 expression.</td> </tr> </table>	Cell Line:	STC-1 cells	Concentration:	300 ng/ml	Incubation Time:	1 hour	Result:	Upregulated TAS1R2, TAS1R3, and TRPM5 expression.
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In Vivo	<p>3-Deoxyglucosone (intra-gastric administration; 20 mg/kg; single dose) impairs glucose tolerance with increased AUC, but the plasma glucagon levels are not significantly different. It develops impaired glucose regulation (IGR) with obviously pancreatic islet cell dysfunction in kunming mice and SD-rats^[2].</p> <p>3-deoxyglucosone (gastric gavage; 5-50 mg/kg; once daily; 2 weeks) is significantly increased in the upper small intestine (1.4-fold), lower small intestine (1.4-fold), ileum (1.4-fold) and colon (two fold) compared with the basal levels in the corresponding control group. In addition, the protein expressions of TAS1R2, TAS1R3 and TRPM5 in both duodenum and colon are significantly decreased^[3].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <table border="1"> <tr> <td>Animal Model:</td> <td>SD rats^[3]</td> </tr> </table>	Animal Model:	SD rats ^[3]						
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Dosage:	5, 20 and 50 mg/kg
Administration:	oral administration; once daily; 2 weeks
Result:	Was capable of accumulating in intestinal tissue and thereby decreased secretion of GLP-1 and insulin.

REFERENCES

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