

Product data sheet



MedKoo Cat#: 510316 Name: Duvoglustat HCl CAS#: 73285-50-4 (HCl) Chemical Formula: C ₆ H ₁₄ ClNO ₄ Molecular Weight: 199.631	
Product supplied as: Powder	
Purity (by HPLC): ≥ 98%	
Shipping conditions: Ambient temperature	
Storage conditions: Powder: -20°C 3 years; 4°C 2 years. In solvent: -80°C 3 months; -20°C 2 weeks.	

1. Product description:

Duvoglustat, also known as AT2220, 1-Deoxynojirimycin, Moranoline, deoxynojirimycin or DNJ, is a potent and selective alpha-glucosidase inhibitor, most commonly found in mulberry leaves. Duvoglustat is used to suppress the elevation of postprandial hyperglycemia. Duvoglustat acts as an antihyperglycemic agent by slowing the rate of carbohydrate degradation to monosaccharides. Duvoglustat inhibits glucose absorption by suppressing intestinal glucose transport. Duvoglustat accelerates glucose utilization by regulating hepatic glucose metabolism enzymes. Duvoglustat directly regulates expression of hepatic enzymes involved in glucose metabolism.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under “QC And Documents” section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	10.0	50.09

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	5.01 mL	25.05 mL	50.09 mL
5 mM	1.00 mL	5.01 mL	10.02 mL
10 mM	0.50 mL	2.50 mL	5.01 mL
50 mM	0.10 mL	0.50 mL	1.00 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of “Calculator”

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Li AN, Chen JJ, Li QQ, Zeng GY, Chen QY, Chen JL, Liao ZM, Jin P, Wang KS, Yang ZC. Alpha-glucosidase inhibitor 1-Deoxynojirimycin promotes beige remodeling of 3T3-L1 preadipocytes via activating AMPK. *Biochem Biophys Res Commun.* 2019 Feb 19;509(4):1001-1007. doi: 10.1016/j.bbrc.2019.01.023. Epub 2019 Jan 14. PMID: 30654939.
2. Ji S, Liu M, Zhang Y, Zhang H. Improvement Activity of 1-Deoxynojirimycin in the Growth of Dairy Goat Primary Mammary Epithelial Cell through Upregulating LEF-1 Expression. *Biomed Res Int.* 2018 Feb 19;2018:7809512. doi: 10.1155/2018/7809512. PMID: 29670907; PMCID: PMC5836298.

In vivo study

1. Liu Q, Li X, Li C, Zheng Y, Wang F, Li H, Peng G. 1-Deoxynojirimycin Alleviates Liver Injury and Improves Hepatic Glucose Metabolism in db/db Mice. *Molecules.* 2016 Feb 27;21(3):279. doi: 10.3390/molecules21030279. PMID: 26927057; PMCID: PMC6274115.
2. E S, Yamamoto K, Sakamoto Y, Mizowaki Y, Iwagaki Y, Kimura T, Nakagawa K, Miyazawa T, Tsuduki T. Intake of mulberry 1-Deoxynojirimycin prevents colorectal cancer in mice. *J Clin Biochem Nutr.* 2017 Jul;61(1):47-52. doi: 10.3164/jcbs.16-94. Epub 2017 May 16. PMID: 28751809; PMCID: PMC5525018.

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7. Bioactivity

Biological target:

1-Deoxynojirimycin hydrochloride (Duvoglustat hydrochloride) is a α -glucosidase inhibitor that suppresses postprandial blood glucose and is widely used for diabetes mellitus.

In vitro activity

The primary mammary epithelial cells were seeded into a 6-well plate at the density of $3 \times 10^5/\text{cm}^2$, and the wells were added with DNEM/F12 medium containing $6 \mu\text{M}$ DNJ. DNJ treatment supplied pAD-LEF-1-mediated LEF-1 overexpression vector that resulted in LEF-1 overexpression that could synergistically display a remarkable effect on increasing the primary mammary epithelial cell density (Figures 2(a) and 2(c)). In addition, DNJ displayed a similar function in alleviating the growth suppression of epithelial cell and the decrease of LEF-1 mRNA level resulting from lentiviral-mediated LEF-1 knockdown. In conclusion, DNJ could improve breast epithelial cell growth through upregulating LEF-1 expression, which supplied a new means in studying mammary gland growth and development.

Reference: Biomed Res Int. 2018 Feb 19;2018:7809512. <https://pubmed.ncbi.nlm.nih.gov/29670907/>

In vivo activity

The present study investigated the effect of 1-Deoxynojirimycin (DNJ) on liver injury and hepatic glucose metabolism in db/db mice. Mice were divided into five groups: normal control, db/db control, DNJ-20 (DNJ 20 mg·kg⁻¹·day⁻¹), DNJ-40 (DNJ 40 mg·kg⁻¹·day⁻¹) and DNJ-80 (DNJ 80 mg·kg⁻¹·day⁻¹). DNJ treatment remarkably reduced serum levels of TG (triglyceride), TC (total cholesterol) and LDL-C (low-density lipoprotein cholesterol) in a dose-dependent manner. Liver lipid content and lipid droplet size were significantly attenuated by DNJ treatment in a dose-dependent manner. DNJ treatment also notably decreased the levels of TNF α , IL-1, and IL-6 in liver tissue in a dose-dependent manner when compared with the db/db control group. Moreover, DNJ increased the phosphorylation of phosphatidylinositol 3 kinase (PI3K) on p85, protein kinase B (PKB) on Ser473, glycogen synthase kinase 3 β (GSK-3 β) on Ser9, and inhibited phosphorylation of glycogen synthase (GS) on Ser645 in liver tissue of db/db mice. These results demonstrate that DNJ can increase hepatic insulin sensitivity via strengthening of the insulin-stimulated PKB/GSK-3 β signal pathway and by modulating glucose metabolic enzymes in db/db mice.

Reference: Molecules. 2016 Feb 27;21(3):279. <https://pubmed.ncbi.nlm.nih.gov/26927057/>

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.