Product Data Sheet

Product Name: N-Methylmoranoline (MOR 14)
Cat. No.: GC30637

Chemical Properties

Cas. No.	69567-10-8		
SMILES	O[C@@H]1[C@@H](CO)N(C)C[C@H](O)[C@H]1O		
Formula	$C_7H_{15}NO_4$	M.Wt	177.2
Solubility	Soluble in DMSO	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	N-Methylmoranoline (MOR 14)		

Protocol

Kinase experiment:

The inhibitory action of N-Methylmoranoline against myocardial α-1,6-glucosidase is first examined in rabbit heart extracts. The substrate mixture contained 44 mM glycylglycine (pH 6.5), 12.5% rabbit liver glycogen, 2.5 mM [14C]glucose (20 μCi/μM), 2.1 mM EDTA, 4.1 mM mercaptoethanol, 0.02% gelatin, and N-Methylmoranoline (0, 0.01, 0.03, 0.1, 0.3, or 1.0 μM). This solution (16 μL) is warmed at 30°C for 2 minutes, and the reaction is then initiated by the addition of 4 μL of the rabbit heart homogenate. The reaction is stopped 60 minutes later by the addition of 20 μL of 0.2N HCl. An aliquot (30 μL) is spotted onto a Whatman GF/A glass fiber disk. The disk is immediately washed in 66% ethanol for 20 minutes three times each and dipped in 15 mL of acetone for 10 minutes. Then the disk is dried, and the [14C] activity incorporated into glycogen is measured with a liquid scintillation counter[1].

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

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Animal experiment:

Rabbits: To investigate the infarct size-reducing effect of N-Methylmoranoline, 54 rabbits are assigned randomly into drug treatment or saline control groups. There are four drug treatment groups, ie, three preischemic treatment groups given 100 mg/kg, 50 mg/kg, or 25 mg/kg of N-Methylmoranoline 10 minutes before ischemia, and one prereperfusion treatment group given 100 mg/kg of the drug 5 minutes before reperfusion. In all treatments, the injected volume is <1 mL/kg body wt. After the treatment, the coronary artery is occluded for 30 minutes and reperfused. The blood pressure and heart rate are monitored throughout the experiment until 20 minutes after reperfusion and are recorded at baseline, at 0, 1, 3, 5, 10, 20, and 30 minutes of ischemia, and at 5, 10, and 20 minutes of reperfusion[1].

References:

[1]. Arai M, et al. N-methyl-1-deoxynojirimycin (MOR-14), an alpha-glucosidase inhibitor, markedly reduced infarct size in rabbit hearts. Circulation. 1998 Apr 7;97(13):1290-7.
[2]. Arai M, et al. Role of protein kinase C in the reduction of

infarct size by N-methyl-1-deoxynojirimycin, an alpha-1,6-glucosidase inhibitor. Br J Pharmacol. 2001 Jul;133(5):635-42.
[3]. Nishida Y, et al. N-methyl-1-deoxynojirimycin (MOR-14), an alpha-glucosidase inhibitor, markedly improves postischemic left ventricular dysfunction. Heart Vessels. 2000;15(6):268-73.

Background

N-Methyldeoxynojirimycin is an inhibitor of α-glucosidases and glycoprotein processing.[1] It inhibits the rabbit intestinal α-glucosidases sucrase and maltase (IC_{50}s = 0.068 and 0.46 ?g/ml, respectively) and *R. niveus* glucoamylase (IC_{50}s = 1.6 and 4.7 ?g/ml with starch or maltose as substrates, respectively).[2] It is selective for these enzymes over β-glucosidase (IC_{50} = 363 ?g/ml). N-Methyldeoxynojirimycin inhibits highly pathogenic avian influenza (HPAI) oligosaccharide processing in HPAI-infected chicken embryo cells.[1] It reduces the cytopathic effect of HIV in infected Karpas-45 T cells.[3] N-

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Methyldeoxynojirimycin also inhibits postprandial increases in blood glucose levels in sucrose-loaded rats (ED_{50} = 5.8 mg/kg).

1.Romero, P.A., Datema, R., and Schwarz, R.T.N-Methyl-1-deoxynojirimycin, a novel inhibitor of glycoprotein processing, and its effect on fowl plague virus maturationVirology130(1)238-242(1983) 2.Yoshikuni, Y.Inhibition of intestinal α-glucosidase activity and postprandial hyperglycemia by moranoline and its N-alkyl derivativesAgric. Biol. Chem.52(1)121-128(1988) 3.Karpas, A., Fleet, G.W.J., Dwek, R.A., et al.Aminosugar derivatives as potential anti-human immunodeficiency virus agentsProc. Natl. Acad. Sci. USA85(23)9229-9233(1988)

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