Hydroxocobalamin monohydrochloride

Cat. No.: HY-B2209A

CAS No.: 59461-30-2

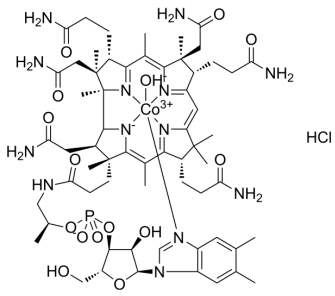
Molecular Formula: $C_{62}H_{90}ClCoN_{13}O_{15}P$

Molecular Weight: 1382.82

Target: Endogenous Metabolite

Pathway: Metabolic Enzyme/Protease

Storage: 4°C, sealed storage, away from moisture and light
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (72.32 mM; Need ultrasonic)
H_2O : 25 mg/mL (18.08 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	0.7232 mL	3.6158 mL	7.2316 mL
5 mM	0.1446 mL	0.7232 mL	1.4463 mL
10 mM	0.0723 mL	0.3616 mL	0.7232 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 50 mg/mL (36.16 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (1.81 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (1.81 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Hydroxocobalamin monohydrochloride (Vitamin B12a monohydrochloride) is an injectable naturally occurring form of vitamin B12 with a favorable adverse effect profile, used as a dietary supplement in the treatment of vitamin B12 deficiency including pernicious anemia[1][2].

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

The cobalt atom of hydroxocobalamin binds cyanide and nitric oxide and hydroxocobalamin attenuates vascular responses

	to NO in vitro[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Treatment with hydroxocobalamin before or after giving LPS attenuates LPS-induced hypotension and increases in plasma RNI and enhances LPS-induced urinary excretion of RNI. Hydroxocobalamin (20 mg/kg i.p.) given to Swiss-Webster mice 30 min before giving LPS (16 mg/kg i.p.) decreases the 24-hr mortality of LPS from 80 to 50% and the 36- and 96-hr mortality from 100 to 60% (hydroxocobalamin)[3]. More than 60% of the mice administered 35 mg/kg (0.63 mmol/kg) of NaSH (LD90) survive (at 24 h) when hydroxocobalamin (0.25 mmol/kg) is given after NaSH administration whereas less than 15% of the mice survive without hydroxocobalamin. Hydroxocobalamin (50–100 μM) or cobalt (50–100 μM) also preventes hepatocyte cytotoxicity induced by NaSH (500 μM). Furthermore, adding hydroxocobalamin 60 min later than NaSH still shows some protective activity[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [1][4]	Rats: Rats are pretreated with sterile PBS (0.1 mL/kg i.v.) 30 min before administration of LPS (0.8 mg/kg i.v.). Fifteen minutes after administration of LPS, when the 125-mediated decrease in blood pressure is maximum, the rats are administered either PBS (0.1 mI/kg i.v.) or hydroxocobalamin (20-30 mg/kg i.v.). Blood pressure, heart rate and RNI are measured[1]. Mice: Adult male CD1 mice, 25-30 g body weight are allowed to acclimatize for at least 7 days prior to experiment on standard chip bedding. All animals are fed ad libitum and are not fasted before experiments. Mice are treated with 0.1 mL/25 g volume per weight ratio of single injection. The survival of animals is recorded 24 h after the treatment[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Commun. 2021 Nov 22;12(1):6786.

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REFERENCES

[1]. Cheungpasitporn W, et al. High-dose hydroxocobalamin for vasoplegic syndrome causing false blood leak alarm. Clin Kidney J. 2017 Jun;10(3):357-362.

[2]. Wang H, et al. Oral vitamin B12 versus intramuscular vitamin B12 for vitamin B12 deficiency. Cochrane Database Syst Rev. 2018 Mar 15;3:CD004655.

[3]. Greenberg SS, et al. Hydroxocobalamin (vitamin B12a) prevents and reverses endotoxin-induced hypotension and mortality in rodents: role of nitric oxide. J Pharmacol Exp Ther. 1995 Apr;273(1):257-65.

[4]. Truong DH, et al. Prevention of hydrogen sulfide (H2S)-induced mouse lethality and cytotoxicity by hydroxocobalamin (vitamin B(12a)). Toxicology. 2007 Dec 5;242(1-3):16-22.

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