Thiamine nitrate

Cat. No.: HY-B2223

CAS No.: 532-43-4

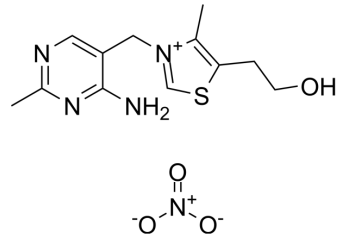
Molecular Formula: $C_{12}H_{17}N_5O_4S$

Molecular Weight: 327.36

Target: Endogenous Metabolite; Bacterial

Pathway: Metabolic Enzyme/Protease; Anti-infection

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 : 20 mg/mL (61.09 mM; Need ultrasonic)

Preparing Stock Solutions	Concentration / Solvent / Mass	1 mg	5 mg	10 mg
	1 mM	3.0547 mL	15.2737 mL	30.5474 mL
	5 mM	0.6109 mL	3.0547 mL	6.1095 mL
	10 mM	0.3055 mL	1.5274 mL	3.0547 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (7.64 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (7.64 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (7.64 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Thiamine nitrate is an essential vitamin which can enhance normal neuronal actives.

IC_{50} & Target

Microbial Metabolite | Human Endogenous Metabolite

In Vitro

Thiamine levels in the blood of homozygous KO and KI mice fed a conventional diet are decreased to 0.058±0.051 and 0.126±0.092 μM, respectively, at 7 weeks compare to WT mice (0.796±0.259 μM). When WT and homozygous KO and KI mice are fed a Thiamine-restricted diet (Thiamine: 0.60 mg/100 g food), blood Thiamine concentration at 5 and 14 days is markedly decreased to 0.010±0.009 and 0.010±0.006 μM, respectively, compare to WT mice (0.609±0.288 μM). Thiamine

	concentration in brain homogenate of WT mice fed a conventional diet is 3.81±2.18 nmol/g wet weight, and that of KO and KI is 1.33±0.96 and 2.16±1.55 nmol/g wet weight, respectively. Notably, Thiamine concentration in brain homogenate decreases steadily in KO and KI mice fed a thiamine-restrict diet (Thiamine: 0.60 mg/100 g food) for 5 days (0.95±0.72 nmol/g wet weight) and 14 days (1.11±0.24 nmol/g wet weight), respectively, compare to WT (3.65±1.02 nmol/g wet weight), before the mice presenting an phenotype of disease[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	WT, homozygous, and heterozygous KO and KI mice fed a conventional diet (thiamine: 1.71 mg/100 g) survive for over 6 months without any phenotype of disease. Homozygous KO and KI mice fed a Thiamine-restricted diet (thiamine: 0.60 mg/100 g food) show paralysis, weight loss, and immobility, and die within 12 and 30 days, respectively. Similarly, homozygous KO and KI mice fed a Thiamine-restricted diet with an even lower percentage of Thiamine (Thiamine: 0.27 mg/100 g food) die within 14 and 18 days, respectively. However, WT and heterozygous KO and KI mice fed a Thiamine-restricted diet (Thiamine: 0.60 mg or 0.27 mg/100g food) survive for over 6 months without any phenotype of disease[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [2]	Slc19a3 E314Q KI mice are maintained routinely with conventional diet, which has a Thiamine concentration (thiamine hydrochloride, MW=337.3) of 1.71 mg/100 g food. Two types of Thiamine-restrict food base on “purified diets for laboratory rodents” are prepared, in which Thiamine concentration is 0.60 mg/100 g food (35% Thiamine of conventional food) or 0.27 mg/100 g food (16% Thiamine of conventional food). A high-Thiamine-containing food is also prepared from AIN-93M, in which Thiamine concentration is five times that of CE-2 (thiamine: 8.50 mg/100 g food)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Kenneth Osiezagha, et al.Thiamine Deficiency and Delirium. Innov Clin Neurosci. 2013 Apr; 10(4): 26-32.

[2]. Kaoru Suzuki, et al. High-dose thiamine prevents brain lesions and prolongs survival ofSlc19a3-deficient mice. PLoS One. 2017; 12(6): e0180279.

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