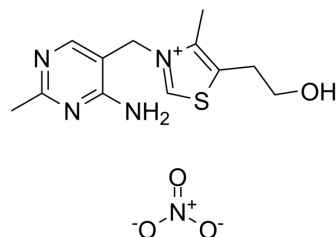


## Thiamine nitrate

<b>Cat. No.:</b>	HY-B2223
<b>CAS No.:</b>	532-43-4
<b>Molecular Formula:</b>	C <sub>12</sub> H <sub>17</sub> N <sub>5</sub> O <sub>4</sub> S
<b>Molecular Weight:</b>	327.36
<b>Target:</b>	Endogenous Metabolite; Bacterial
<b>Pathway:</b>	Metabolic Enzyme/Protease; Anti-infection
<b>Storage:</b>	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

<b>In Vitro</b>	DMSO : 20 mg/mL (61.09 mM; Need ultrasonic)					
	<b>Preparing Stock Solutions</b>	<b>Solvent</b>	<b>Mass</b>	<b>1 mg</b>	<b>5 mg</b>	<b>10 mg</b>
		<b>Concentration</b>				
		<b>1 mM</b>		3.0547 mL	15.2737 mL	30.5474 mL
		<b>5 mM</b>		0.6109 mL	3.0547 mL	6.1095 mL
	<b>10 mM</b>		0.3055 mL	1.5274 mL	3.0547 mL	
Please refer to the solubility information to select the appropriate solvent.						
<b>In Vivo</b>	<ol style="list-style-type: none"> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 40% PEG300 &gt;&gt; 5% Tween-80 &gt;&gt; 45% saline Solubility: ≥ 2.5 mg/mL (7.64 mM); Clear solution</li> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 90% (20% SBE-β-CD in saline) Solubility: ≥ 2.5 mg/mL (7.64 mM); Clear solution</li> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 90% corn oil Solubility: ≥ 2.5 mg/mL (7.64 mM); Clear solution</li> </ol>					

### BIOLOGICAL ACTIVITY

<b>Description</b>	Thiamine nitrate is an essential vitamin which can enhance normal neuronal actives.	
<b>IC<sub>50</sub> &amp; Target</b>	Microbial Metabolite	Human Endogenous Metabolite
<b>In Vitro</b>	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  $3.81 \pm 2.18$  nmol/g wet weight, and that of KO and KI is  $1.33 \pm 0.96$  and  $2.16 \pm 1.55$  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 ( $0.95 \pm 0.72$  nmol/g wet weight) and 14 days ( $1.11 \pm 0.24$  nmol/g wet weight), respectively, compare to WT ( $3.65 \pm 1.02$  nmol/g wet weight), before the mice presenting an phenotype of disease<sup>[2]</sup>.

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<sup>[2]</sup>. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## PROTOCOL

#### Animal Administration<sup>[2]</sup>

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)<sup>[2]</sup>.

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 of Slc19a3-deficient mice. *PLoS One*. 2017; 12(6): e0180279.

**Caution: Product has not been fully validated for medical applications. For research use only.**

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