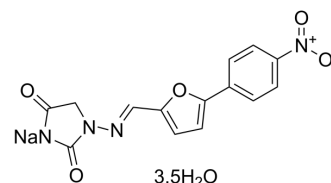


## Dantrolene sodium hemiheptahydrate

<b>Cat. No.:</b>	HY-12542A
<b>CAS No.:</b>	24868-20-0
<b>Molecular Formula:</b>	C <sub>14</sub> H <sub>16</sub> N <sub>4</sub> NaO <sub>8.5</sub>
<b>Molecular Weight:</b>	399
<b>Target:</b>	Calcium Channel; Autophagy
<b>Pathway:</b>	Membrane Transporter/Ion Channel; Neuronal Signaling; Autophagy
<b>Storage:</b>	4°C, sealed storage, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



### SOLVENT & SOLUBILITY

#### In Vitro

DMSO : ≥ 33 mg/mL (82.71 mM)  
 H<sub>2</sub>O : < 0.1 mg/mL (ultrasonic;warming;heat to 60°C) (insoluble)  
 \* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	2.5063 mL	12.5313 mL	25.0627 mL
	5 mM	0.5013 mL	2.5063 mL	5.0125 mL
	10 mM	0.2506 mL	1.2531 mL	2.5063 mL

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

#### In Vivo

- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
 Solubility: ≥ 0.5 mg/mL (1.25 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
 Solubility: ≥ 0.5 mg/mL (1.25 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

Dantrolene sodium hemiheptahydrate is an orally active, non-competitive glutathione reductase inhibitor with a K<sub>i</sub> of 111.6 μM and an IC<sub>50</sub> of 52.3 μM. Dantrolene sodium hemiheptahydrate is a ryanodine receptor (RyR) antagonist and Ca<sup>2+</sup> signaling stabilizer. Dantrolene sodium hemiheptahydrate is a direct-acting skeletal muscle relaxant. Dantrolene sodium hemiheptahydrate can be used for the research of muscle spasticity, malignant hyperthermia, Huntington's disease and other neuroleptic malignant syndrome<sup>[1][2][3]</sup>.

#### In Vitro

Dantrolene (60 μM; at 1 and 3 days) sodium hemiheptahydrate significantly inhibits ACTA2 expression and upregulates RUNX2 expression in paVICs<sup>[2]</sup>.  
 Dantrolene (60 μM; overnight pretreatment) sodium hemiheptahydrate inhibits LPC-induced calcium flux in porcine aortic

valve interstitial cells<sup>[2]</sup>.  
Dantrolene (10, 30, 60  $\mu$ M) sodium hemiheptahydrate inhibits calcific nodule formation of paVICs due to 10  $\mu$ M lysophosphatidylcholine (LPC)<sup>[2]</sup>.  
MCE has not independently confirmed the accuracy of these methods. They are for reference only.  
RT-PCR<sup>[2]</sup>

Cell Line:	Porcine aortic valvular interstitial cells (paVICs)
Concentration:	60 $\mu$ M
Incubation Time:	At 1 and 3 days
Result:	Significantly inhibited ACTA2 expression and upregulated RUNX2 expression.

#### In Vivo

Dantrolene (5 mg/kg; fed orally twice per week) sodium hemiheptahydrate improves performance in the beam-walking and gait-walking assay<sup>[3]</sup>.  
Dantrolene (10 mg/kg; IP; three days per week; for 40-60 days) sodium hemiheptahydrate significantly improves gait, reduces LC3-II levels, improves mitochondrial ATP production and reduced inflammation in the brain. Dantrolene sodium hemiheptahydrate partially reduces autophagy and the expression of CALM (calmodulin) in the brain of neuronopathic Gaucher disease mice<sup>[4]</sup>.  
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	YAC128 transgenic mice (FVBN/NJ background strain) and WT mice <sup>[3]</sup>
Dosage:	5 mg/kg
Administration:	Fed orally twice per week from 2 to 11.5 months of age
Result:	Resulted in significantly improved performance in the beam-walking and gait-walking assays. Significantly reduced the loss of NeuN-positive striatal neurons and reduced formation of Httexp nuclear aggregates.

## CUSTOMER VALIDATION

- Cell Res. 2022 Mar;32(3):288-301.
- Front Immunol. 2021 Jul 7;12:688674.
- J Anim Sci Biotechnol. 2022 Feb 11;13(1):9.
- Anim Nutr. 28 September 2021.
- J Cell Commun Signal. 2023 Sep 13.

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## REFERENCES

- [1]. Murat Sentürk, et al. Dantrolene inhibits human erythrocyte glutathione reductase. Biol Pharm Bull. 2008 Nov;31(11):2036-9.
- [2]. Christopher B Sylvester, et al. Dantrolene inhibits lysophosphatidylcholine-induced valve interstitial cell calcific nodule formation via blockade of the ryanodine receptor. Front Cardiovasc Med. 2023 Mar 30;10:1112965.
- [3]. Xi Chen, et al. Dantrolene is neuroprotective in Huntington's disease transgenic mouse model. Mol Neurodegener. 2011 Nov 25;6:81.

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[4]. Benjamin Liou, et al. Modulating ryanodine receptors with dantrolene attenuates neuronopathic phenotype in Gaucher disease mice. Hum Mol Genet. 2016 Dec 1;25(23):5126-5141.

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

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