

Product Data Sheet

Product Name: Dantrolene

Cat. No.: GC65503

Chemical Properties

Cas. No. 7261-97-4

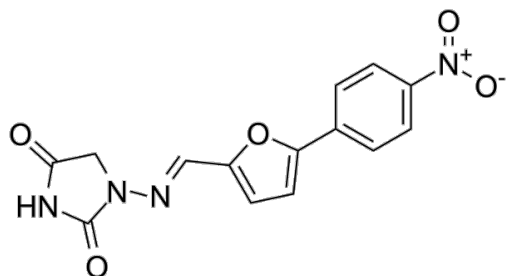
Formula $C_{14}H_{10}N_4O_5$ M.Wt 314.25

Solubility DMSO : ≥ 20 mg/mL (63.64 mM) Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C 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



Background

Dantrolene (F368), a muscle relaxant, non-competitively inhibits human erythrocyte glutathione reductase. K_i and IC_{50} values are $111.6\ \mu\text{M}$ and $52.3\ \mu\text{M}$, respectively. Dantrolene is a ryanodine receptor antagonist and Ca^{2+} signaling stabilizer. Dantrolene can be used for the research of muscle spasticity, malignant hyperthermia, Huntington's disease and other neuroleptic malignant syndrome[1][2][3][4][5].

Dantrolene interferes with calcium release from the sarcoplasmic reticulum and thus to inhibit excitation--contraction coupling[1]. Dantrolene acts directly on the RYR1 to reduce the extent of

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

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channel activation by calmodulin (CaM) and thereby decreases the Ca²⁺ sensitivity of channel activation[2]. Dantrolene inhibits abnormal Ca²⁺ release from the sarcoplasmic reticulum[3]. Dantrolene depresses excitation-contraction coupling in muscle fibers by inhibiting calcium release from the sarcoplasmic reticulum[3]. Dantrolene also shows calcium channel blocker effect in the smooth muscle membrane as well as antioxidative and cytoprotective properties[3]. Dantrolene affects the membrane calcium channel of smooth muscle cells and inhibits calcium influx[3]. Dantrolene is a skeletal muscle-specific muscle relaxant that works on the cardiac muscle. Dantrolene (0.3 μM) binds to domain 601-620 of RyR2 and corrects defective inter-domain interaction within RyR2 in failing hearts. This in turn inhibits spontaneous Ca²⁺⁺ leak/Ca²⁺ sparks, and improves cardiomyocyte function in failing hearts[4].

Dantrolene is neuroprotective in Huntington's disease transgenic mouse model[5]. Feeding dantrolene (5 mg/kg) twice a week to YAC128 mice between 2 months and 11.5 months of age resulted in significantly improved performance in the beam-walking and gait-walking assays[5].

[1]. W J Meyler, et al. The effect of dantrolene sodium on rat skeletal muscle in relation to the plasma concentration. Eur J Pharmacol. 1979 Feb 1;53(4):335-42.

[2]. F Zhao, et al. Dantrolene inhibition of ryanodine receptor Ca²⁺ release channels. Molecular mechanism and isoform selectivity. J Biol Chem. 2001 Apr 27;276(17):13810-6.

[3]. Murat Sentürk, et al. Dantrolene inhibits human erythrocyte glutathione reductase. Biol Pharm Bull. 2008 Nov;31(11):2036-9.

[4]. Shigeki Kobayashi, et al. Dantrolene, a therapeutic agent for malignant hyperthermia, markedly improves the function of failing cardiomyocytes by stabilizing interdomain interactions within the ryanodine receptor. J Am Coll Cardiol. 2009 May 26;53(21):1993-2005.

[5]. 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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