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Laborgeräte & Service

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See the following pages for more information!

PRODUCT INFORMATION

Dantrolene-d$_4$
Item No. 29451

Formal Name:	1-[[[5-(4-nitrophenyl)-furanyl] methylene]amino]-2,4-imidazolidinedione
MF:	$C_{14}H_6D_4N_4O_5$
FW:	318.3
Chemical Purity:	≥98% (Dantrolene)
Deuterium Incorporation:	≥99% deuterated forms (d$_1$-d$_4$); ≤1% d$_0$
Supplied as:	A solid
Storage:	-20°C
Stability:	≥2 years
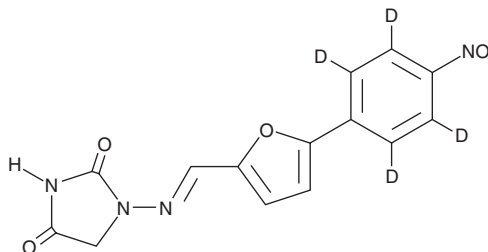
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Dantrolene-d$_4$ is intended for use as an internal standard for the quantification of dantrolene (Item No. 14326) by GC- or LC-MS. The accuracy of the sample weight in this vial is between 5% over and 2% under the amount shown on the vial. If better precision is required, the deuterated standard should be quantitated against a more precisely weighed unlabeled standard by constructing a standard curve of peak intensity ratios (deuterated *versus* unlabeled).

Dantrolene-d$_4$ is supplied as a solid. A stock solution may be made by dissolving the dantrolene-d$_4$ in the solvent of choice, which should be purged with an inert gas. Dantrolene-d$_4$ is soluble in DMSO.

Description

Dantrolene is an inhibitor of calcium release from the sarcoplasmic reticulum (IC$_{50}$ = 0.3 µM).[1] It binds to sarcoplasmic reticulum vesicles isolated from normal and malignant hyperthermia-susceptible (MHS) pigs with K$_d$ values of 0.3 and 0.09 µM, respectively. Dantrolene reduces spontaneous calcium wave frequency and amplitude in the presence of calmodulin in isolated mouse cardiomyocytes with IC$_{50}$ values of 0.42 and 0.19 µM, respectively.[2] It reduces the magnitude of electrically stimulated twitch tensions in isolated rat extensor digitorum longus and soleus muscles (IC$_{50}$ = 3 µg/ml) and MHS pigs (ED$_{50}$ = 0.85 mg/kg).[3,4] Formulations containing dantrolene have been used in the treatment of malignant hyperthermia.

References

1. Kobayashi, S., Yano, M., Suetomi, T., *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.* **53(21)**, 1993-2005 (2009).
2. Y.W., Gomez-Hurtado, N., Walweel, K., *et al.* Essential role of calmodulin in RyR inhibition by dantrolene. *Mol. Pharmacol.* **88(1)**, 57-63 (2015).
3. Kotsias, B.A. and Muchnik, S. Reversible effect of dantrolene sodium on twitch tension of rat skeletal muscle. *Arch. Neurol.* **35(4)**, 234-236 (1978).
4. Nelson, T.E. and Flewellen, E.H. Rationale for dantrolene vs. procainamide for treatment of malignant hyperthermia. *Anesthesiology* **50(2)**, 118-122 (1979).