

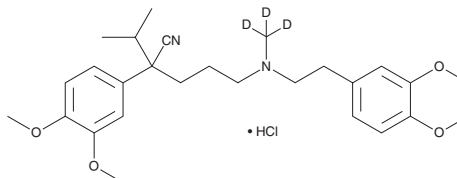
# PRODUCT INFORMATION



## (±)-Verapamil-d<sub>3</sub> (hydrochloride)

Item No. 18452

**CAS Registry No.:** 2714485-49-9  
**Formal Name:** α-[3-[[2-(3,4-dimethoxyphenyl)ethyl]methyl-d<sub>3</sub>-amino]propyl]-3,4-dimethoxy-α-(1-methylethyl)-benzeneacetonitrile  
**MF:** C<sub>27</sub>H<sub>35</sub>D<sub>3</sub>N<sub>2</sub>O<sub>4</sub> • HCl  
**FW:** 494.1  
**Chemical Purity:** ≥98% (Verapamil)  
**Deuterium Incorporation:** ≥99% deuterated forms (d<sub>1</sub>-d<sub>3</sub>); ≤1% d<sub>0</sub>  
**Supplied as:** A crystalline solid  
**Storage:** -20°C  
**Stability:** ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Laboratory Procedures

(±)-Verapamil-d<sub>3</sub> (hydrochloride) is intended for use as an internal standard for the quantification of verapamil (Item No. 14288) 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).

(±)-Verapamil-d<sub>3</sub> (hydrochloride) is supplied as a crystalline solid. A stock solution may be made by dissolving the (±)-verapamil-d<sub>3</sub> (hydrochloride) in the solvent of choice, which should be purged with an inert gas. (±)-Verapamil-d<sub>3</sub> (hydrochloride) is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of (±)-verapamil-d<sub>3</sub> (hydrochloride) in ethanol and DMSO is approximately 10 mg/ml and approximately 15 mg/ml in DMF.

### Description

Verapamil is the prototypical blocker of L-type calcium channels that produces excitation-contraction uncoupling in cardiac muscle by preventing the slow-inward current of calcium ions.<sup>1</sup> Verapamil can also block calcium fluxes in vascular smooth muscle. It has both peripheral and coronary vasodilator effects (IC<sub>50</sub> = 0.38 μM in guinea pig aortic strip) and has been used to control hypertension, angina, cardiac arrhythmia, and vascular headaches.<sup>2-4</sup> Verapamil has also been used in cell biology as an inhibitor of drug efflux pump proteins such as P-glycoprotein, which are often over-expressed in certain tumor cell lines.<sup>5</sup>

### References

1. Singh, B.N. *Br. J. Clin. Pharmacol.* **21**, 109S-121S (1986).
2. Dei, S., Romanelli, M.N., Scapecchi, S., et al. *J. Med. Chem.* **36**, 439-445 (1993).
3. Dawson, J.R., Whitaker, N.H.G., and Sutton, G.C. *Br. Heart J.* **46**, 508-512 (2013).
4. Campbell, T.J. and Williams, K.M. *Br. J. Clin. Pharmacol.* **46**, 307-319 (1998).
5. Rabindran, S.K., He, H., Singh, M., et al. *C. Cancer Res.* **58**, 5850-5858 (1998).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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