Verapamil

Cat. No.: HY-14275

CAS No.: 52-53-9

Molecular Formula: $C_{27}H_{38}N_2O_4$

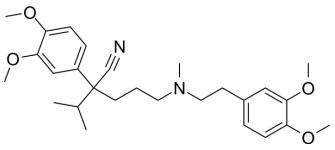
Molecular Weight: 454.6

Target: Calcium Channel; P-glycoprotein; Cytochrome P450

Pathway: Membrane Transporter/Ion Channel; Neuronal Signaling; Metabolic Enzyme/Protease

Storage: 4°C, protect from light

* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (219.97 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.1997 mL	10.9987 mL	21.9974 mL
5 mM	0.4399 mL	2.1997 mL	4.3995 mL
10 mM	0.2200 mL	1.0999 mL	2.1997 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (5.50 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (5.50 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (5.50 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Verapamil ((±)-Verapamil) is a calcium channel blocker and a potent and orally active first-generation P-glycoprotein (P-gp) inhibitor. Verapamil also inhibits CYP3A4. Verapamil has the potential for high blood pressure, heart arrhythmias and angina research[1][2][3].

IC_{50} & Target

CYP3

In Vitro

The EverFluor FL Verapamil (EFV) uptake by TR-iBRB2 cells is inhibited by cationic drugs, and inhibits by verapamil in a concentration-dependent manner with an IC_{50} of 98.0 μM[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo	Given orally Verapamil is useful for the prophylaxis of atrioventricular reentry tachycardia, and also in modulating the atrioventricular nodal response in atrial fibrillation[2]. Verapamil is injected i.v. into a femoral vein prior to ischemia. Verapamil (1 mg/kg) significantly decreases the incidence of ventricular arrhythmias including premature ventricular contractions (PVC), ventricular tachycardia (VT) and ventricular fibrillation (VF) for 45-min coronary artery occlusion. Total arrhythmia scores are significantly increased when the heart is subjected to ischemia. Verapamil (1 mg/kg) significantly prevents the enhancement of total arrhythmia scores induced by ischemia[5]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cancer Cell. 2017 Apr 10;31(4):501-515.e8.
- Adv Mater. 2023 Sep 27:e2211980.
- Cell Stem Cell. 2023 Apr 6;30(4):378-395.e8.
- Bioact Mater. 2021 Apr 21;6(11):4073-4082.
- Research (Wash D C). 2024 Feb 21.

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REFERENCES

[1]. Gowarty JL, et al. Verapamil as a culprit of palbociclib toxicity. J Oncol Pharm Pract. 2019 Apr;25(3):743-746.

[2]. Krikler DM. Verapamil in arrhythmia. Br J Clin Pharmacol. 1986;21 Suppl 2:183S-189S.

[3]. Rehnqvist N,et al. Effects of metoprolol vs verapamil in patients with stable angina pectoris. The Angina Prognosis Study in Stockholm (APSIS). Eur Heart J. 1996 Jan;17(1):76-81.

[4]. Kubo Y, et al. Blood-to-Retina Transport of Fluorescence-Labeled Verapamil at the Blood-Retinal Barrier. Pharm Res. 2018 Mar 12;35(5):93.

[5]. Zhou P, et al. Anti-arrhythmic effect of Verapamil is accompanied by preservation of cx43 protein in rat heart. PLoS One. 2013 Aug 12;8(8):e71567.

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