TOLL FREE PHONE 1 800 667 0322 • PHONE +1 604 877 0713
INFO@STEMCELL.COM • TECHSUPPORT@STEMCELL.COM
FOR GLOBAL CONTACT DETAILS VISIT WWW.STEMCELL.COM

Verapamil (Hydrochloride)

L-type calcium channel blocker

Catalog #100-1652 5 g

Product Description

Verapamil (Hydrochloride) is an L-type calcium channel blocker (IC_{50} = 250 nM - 15.5 µM; Hosey & Lazdunski). Verapamil binds to $Ca_v1.2$, a subunit of L-type voltage-dependent calcium channels, in a voltage- and frequency-dependent manner and inhibits calcium influx (Dilmac et al.; Li & Shi). $Ca_v1.2$ is widely expressed in vascular smooth muscle and myocardial cells, and calcium influx through these channels propagates action potentials involved in muscle contraction (Ghosh et al.; Striessnig et al.). Verapamil also interacts with other calcium and potassium channels and is an inhibitor of P-glycoprotein (Pauli-Magnus et al.; Zhang et al.).

Alternative Names: (±)-Verapamil, NSC 272366, NSC 657799

CAS Number: 152-11-4

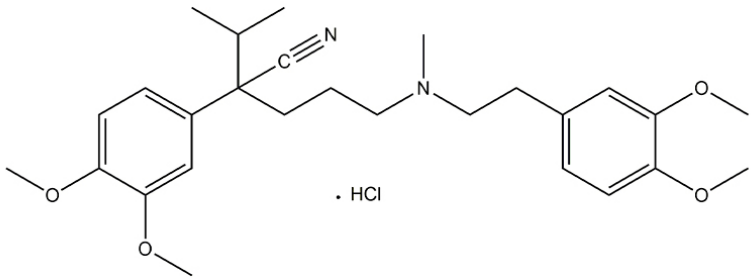
Chemical Formula: $C_{27}H_{38}N_2O_4 \bullet HCl$

Molecular Weight: 491.1 g/mol

Purity: ≥ 98%

Chemical Name: α-[3-[[2-(3,4-dimethoxyphenyl)ethyl]methylamino]propyl]-3,4-dimethoxy-α-(1-methylethyl)-benzeneacetonitrile, monohydrochloride

Structure:



Properties

Product Format: A crystalline solid

Stability and Storage: Product stable at -20°C as supplied. As a precaution, STEMCELL recommends storing all small molecules away from direct light. For long-term storage, store with a desiccant. Stable as supplied for 12 months from date of receipt.

Preparation:

- Phosphate-buffered saline (PBS; pH 7.2) ≤ 505 µM
- DMSO ≤ 20 mM
- Absolute ethanol ≤ 20 mM

For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 204 µL of DMSO.

Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported; however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.

For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO or absolute ethanol concentration above 0.1% due to potential cell toxicity.

Published Applications

CANCER RESEARCH

- Enhances the chemosensitivity of cancer cells to chemotherapeutic agents (Simpson; Wang et al.).
- Improves the anti-tumor activity of an oncolytic adenovirus ICOVIR-5 in mouse xenograft models of lung cancer and melanoma (Gros et al.).

DISEASE MODELING

- Reduces arterial blood pressure values by inhibiting carbonic anhydrase I in human erythrocytes and vascular smooth muscles in animal models (Puscas et al.).
- Reduces pulse pressure and decreases carotid internal diameter, medial thickness, and collagen content in a rat model of spontaneous hypertension (Koffi et al.).
- Reduces the incidence of ventricular and total arrhythmias and reduces heart rate, arterial pressure, and left ventricular systolic pressure in a rat model (Zhou et al.).
- Improves the cardiovascular pathology associated with Williams–Beuren syndrome in combination with curcumin in a mouse model (Abdalla et al.).

References

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Puscas I et al. (2000) Calcium channel blockers reduce blood pressure in part by inhibiting vascular smooth muscle carbonic anhydrase I. Cardiovasc Drugs Ther 14(5): 523–8.
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Related Products

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Warning

This product is hazardous. Please refer to the Safety Data Sheet (SDS).