Ivabradine hydrochloride

Cat. No.: HY-B0162A

CAS No.: 148849-67-6

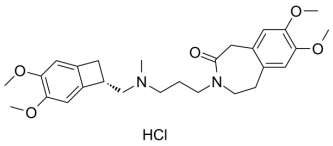
Molecular Formula: $C_{27}H_{37}ClN_2O_5$

Molecular Weight: 505.05

Target: HCN Channel

Pathway: Membrane Transporter/Ion Channel

Storage: 4°C, sealed storage, away from moisture
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

H_2O : 50 mg/mL (99.00 mM; Need ultrasonic)
DMSO : 25 mg/mL (49.50 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.9800 mL	9.9000 mL	19.8000 mL
5 mM	0.3960 mL	1.9800 mL	3.9600 mL
10 mM	0.1980 mL	0.9900 mL	1.9800 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 50 mg/mL (99.00 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (4.95 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (4.95 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Ivabradine hydrochloride is a potent and orally active HCN (hyperpolarization-activated cyclic nucleotide-gated) channel blocker that inhibits the cardiac pacemaker current (If). Ivabradine hydrochloride reduces dose-dependently heart rate without modification of blood pressure. Ivabradine hydrochloride shows anticonvulsant, anti-ischaemic and anti-anginal activity[1][2][3][4].

In Vivo

Ivabradine hydrochloride (1, 10, 20 mg/kg; i.p.) shows anticonvulsant and neuroprotective action in mice[3].
Ivabradine hydrochloride (5, 10, 20 mg/kg;p.o.; daily for 1 weeks) lowers heart rate in mice with enhanced sympathoadrenergic activities[4].

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

Animal Model:	25-30 g, 6 weeks male Swiss mice[3]
Dosage:	1, 10, 20 mg/kg
Administration:	I.p.; for 3 days
Result:	Attenuated PTZ- and PICRO-induced seizures while presented an antioxidant effect in allbrain areas studied, and reduced cleaved caspase-3 expression in the CA1 and DG region of PICRO- and PTZ-treated mice, respectively.

Animal Model:	3-4 months transgenic (TG) mice with cardiac-restricted overexpression of b2AR[4]
Dosage:	5, 10, 20 mg/kg
Administration:	P.o; daily for 1 weeks
Result:	Reduced the maximal HR increase in response to the b-agonist isoproterenol, without modifying the response of contractile parameters at 10 mg/kg.

CUSTOMER VALIDATION

- J Cell Physiol. 2019 Feb;234(2):1925-1936.
- Front Pharmacol. 2021 Jun 22;12:696635.

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REFERENCES

[1]. Tardif JC, et al. Efficacy of ivabradine, a new selective I(f) inhibitor, compared with atenolol in patients with chronic stable angina. Eur Heart J. 2005 Dec;26(23):2529-36.

[2]. Mulder P, et al. Heart rate slowing for myocardial dysfunction/heart failure. Adv Cardiol. 2006;43:97-105.

[3]. Cavalcante TMB, et al. Ivabradine possesses anticonvulsant and neuroprotective action in mice. Biomed Pharmacother. 2019 Jan;109:2499-2512.

[4]. Du XJ, et al. I(f) channel inhibitor ivabradine lowers heart rate in mice with enhanced sympathoadrenergic activities. Br J Pharmacol. 2004 May;142(1):107-12.

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