Phenylephrine hydrochloride

Cat. No.: HY-B0471

CAS No.: 61-76-7

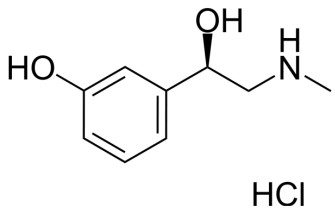
Molecular Formula: $C_9H_{14}ClNO_2$

Molecular Weight: 203.67

Target: Adrenergic Receptor; Endogenous Metabolite

Pathway: GPCR/G Protein; Neuronal Signaling; Metabolic Enzyme/Protease

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



SOLVENT & SOLUBILITY

In Vitro

DMSO : 125 mg/mL (613.74 mM; Need ultrasonic)
H_2O : 100 mg/mL (490.99 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	4.9099 mL	24.5495 mL	49.0990 mL
5 mM	0.9820 mL	4.9099 mL	9.8198 mL
10 mM	0.4910 mL	2.4550 mL	4.9099 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: ≥ 2.08 mg/mL (10.21 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (10.21 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (10.21 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

(R)-(-)-Phenylephrine hydrochloride is a selective α_1-adrenoceptor agonist with pK_is of 5.86, 4.87 and 4.70 for α_{1D}, α_{1B} and α_{1A} receptors respectively.

IC_{50} & Target

α adrenergic receptor

In Vitro

(R)-(-)-Phenylephrine is a selective α_1-adrenoceptor agonist with pK_i values of 5.86, 4.87 and 4.70 for α_{1D}, α_{1B} and α_{1A} receptors respectively[1][2]. Phenylephrine promotes cardiac fibroblast proliferation. Phenylephrine activates CaN and

	evokes NFAT3 nuclear translocation. It suggests that the $Ca^{(2+)}$/CaN/NFAT pathway mediates phenylephrine -induced cardiac fibroblast proliferation, and this pathway might be a possible therapeutic target in cardiac fibrosis[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Perfusion of hearts with 100 μM phenylephrine causes a rapid (maximal at 10 min) 12-fold activation of two p38-MAPK isoforms. α_1-adrenoceptor agonists such as phenylephrine increase the contractility of the heart. Phenylephrine also activates SAPKs/JNKs in neonatal ventricular myocytes[4]. Phenylephrine could increase the alveolar fluid clearance in high tidal volume-ventilated rats and accelerate the absorption of pulmonary edema[5]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [5]	Rat: A total of 170 male Wistar rats are randomLy allocated into 17 groups (n=10) using random number tables. Short-term (40 minutes) mechanical ventilation with high tidal volume is performed to induce lung injury, impair active Na^+ transport and lung liquid clearance in the rats. Unventilated rats serves as controls. To demonstrate the effect of phenylephrine on alveolar fluid clearance, phenylephrine at different concentrations (10, 1, 0.1, 0.01, and 0.001 μM) is injected into the alveolar space of the HVT ventilated rats[5]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Free Radic Biol Med. 2024 Jan 6:S0891-5849(24)00007-8.
- Biochim Biophys Acta Mol Basis Dis. 2023 Aug 27;166859.
- Sci Rep. 2023 Oct 2;13(1):16550.
- J Endod. 2023 Sep 26:S0099-2399(23)00608-8.
- Front Cardiovasc Med. 2021 Jun 16;8:679240.

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REFERENCES

[1]. Ford AP, et al. Pharmacological pleiotropism of the human recombinant alpha1A-adrenoceptor: implications foralpha1-adrenoceptor classification. Br J Pharmacol. 1997 Jul;121(6):1127-35.

[2]. Minneman KP, et al. Selectivity of agonists for cloned alpha 1-adrenergic receptor subtypes. Mol Pharmacol. 1994 Nov;46(5):929-36.

[3]. Wang J, et al. Phenylephrine promotes cardiac fibroblast proliferation through calcineurin-NFAT pathway. Front Biosci (Landmark Ed). 2016 Jan 1;21:502-13.

[4]. Lazou A, et al. Activation of mitogen-activated protein kinases (p38-MAPKs, SAPKs/JNKs and ERKs) by the G-protein-coupled receptor agonist phenylephrine in the perfused rat heart. Biochem J. 1998 Jun 1;332 (Pt 2):459-65.

[5]. Li NJ, et al. Effect of phenylephrine on alveolar fluid clearance in ventilator-induced lung injury. Chin Med Sci J. 2013 Mar;28(1):1-6.

Caution: Product has not been fully validated for medical applications. For research use only.

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