

Product Data Sheet

Product Name: Isoprenaline HCl

Cat. No.: GC11029

Chemical Properties

Cas. No. 51-30-9

Chemical Name 4-[1-hydroxy-2-(propan-2-ylamino)ethyl]benzene-1,2-diol;hydrochloride

SMILES CC(C)NCC(C1=CC(=C(C=C1)O)O)O.Cl

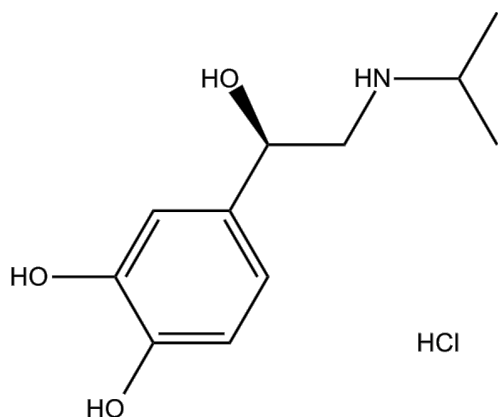
Formula $C_{11}H_{17}NO_3 \cdot HCl$ M.Wt 247.72

Solubility ≥ 12.4 mg/mL in DMSO, ≥ 16.6 mg/mL in EtOH with ultrasonic and warming, ≥ 50.2 mg/mL in Water with gentle warming Storage $4^{\circ}C$, away from moisture and light

General tips For obtaining a higher solubility, please warm the tube at $37^{\circ}C$ and shake it in the ultrasonic bath for a while. Stock solution can be stored below $-20^{\circ}C$ for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

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Cell experiment: Cells are seeded in 24-well culture dishes at a density of 2 to 5×10⁴ cells per well. Experiments are performed after 3 to 5 days in culture when cells have reached confluence. Culture medium is aspirated and replaced by 0.5 mL of PBS containing the pharmacological agents. Treatments are performed in quadruplicate at 37°C. The type 3, 4 and 5 PDE inhibitors cilostamide (10 µM), rolipram (10 µM) and DMPPO (10 µM), respectively, are incubated with cells for 30 min before addition of adenylate or guanylate cyclase activators. Cyclic GMP and cyclic AMP are respectively increased in RASMC by stimulation of particulate guanylate cyclase with ANF (50 nM for 10 min) or β_1 -adrenoceptors with isoprenaline (5 nM for 5 min). At the end of the incubation period, the medium is removed and intracellular cyclic nucleotides are extracted by two ethanolic (65%) washes at 4°C for 5 min. Ethanolic extracts are pooled, evaporated to dryness by a Speed-Vac system. The dried extract is dissolved in a suitable amount of assay buffer and cyclic nucleotide levels are measured by scintillation proximity assay.

References:

- [1]. Degerman E, et al. Evidence that insulin and isoprenaline activate the cGMP-inhibited low-K_m cAMP phosphodiesterase in rat fat cells by phosphorylation. Proc Natl Acad Sci U S A. 1990 Jan;87(2):533-7
- [2]. Vannucci SJ, et al. Cell surface accessibility of GLUT4 glucose transporters in insulin-stimulated rat adipose cells. Modulation by isoprenaline and adenosine. Biochem J. 1992 Nov 15;288 (Pt 1):325-30.
- [3]. Delpy E, et al. Effects of cyclic GMP elevation on isoprenaline-induced increase in cyclic AMP and relaxation in rat aortic smooth muscle: role of phosphodiesterase 3. Br J Pharmacol. 1996 Oct;119(3):471-8.
- [4]. Muller FU, et al. Isoprenaline stimulates gene transcription of the inhibitory G protein α -subunit Gi α -2 in rat heart. Circ Res. 1993 Mar;72(3):696-700.
- [5]. Lei M, et al. Modulation of delayed rectifier potassium current, I_K, by isoprenaline in rabbit isolated pacemaker cells. Exp Physiol. 2000 Jan;85(1):27-35.

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Background

Isoprenaline HCl is an agonist of β -adrenergic receptor [1].

The adrenergic receptors are a class of G protein-coupled receptors that are targets of norepinephrine and epinephrine. When reacting with epinephrine, β -adrenergic receptor causes vasodilation.

In human umbilical vein endothelial cells (HUVECs), isoprenaline (100 nM) significantly increased the expression of connexins Cx43 and also increased Cx40 and Cx37. Also, isoprenaline increased the number of coupling cells. Isoprenaline enhanced the formation of branches and complex tube networks [2].

In the isolated field stimulated rat vas deferens, isoprenaline inhibited contractions with EC₅₀ value of 45.6 nM. In tissues in which β 2-adrenoreceptors were maximally blocked by timolol, isoprenaline inhibited contractility with EC₅₀ value of 1.5 μ M [1]. In CFW mice, IPR caused the maximal proliferative response of bone marrow cells and increased erythropoietic activity. These results suggested that isoprenaline activated beta-adrenergic receptor, which then increased the proliferative and differentiation activities of hemopoietic stem cells [3].

References:

- [1]. Lotti VJ, Cerino D, Kling P. Characterization of the adrenoreceptor activities of isoprenaline in the field stimulated rat vas deferens: selective supersensitivity to beta 2-mediated responses following reserpine treatment. J Auton Pharmacol, 1982, 2(3): 169-174.
- [2]. Dhein S, Gaertner C, Georgieff C, et al. Effects of isoprenaline on endothelial connexins and angiogenesis in a human endothelial cell culture system. Naunyn Schmiedebergs Arch Pharmacol, 2015, 388(1): 101-108.
- [3]. Lipski S. Effect of beta-adrenergic stimulation by isoprenaline on proliferation and differentiation of mouse bone marrow cells in vivo. Pol J Pharmacol Pharm, 1980, 32(3): 281-287.

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