Bucladesine calcium

Cat. No.: HY-B0764A

CAS No.: 938448-87-4

Molecular Formula: $C_{18}H_{23}Ca0.5N_5O_8P$

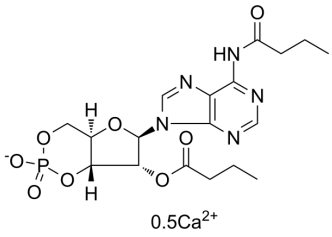
Molecular Weight: 488.42

Target: PKA; Phosphodiesterase (PDE); Apoptosis

Pathway: Protein Tyrosine Kinase/RTK; Stem Cell/Wnt; Metabolic Enzyme/Protease; Apoptosis

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 : 100 mg/mL (204.74 mM; Need ultrasonic)

DMSO : ≥ 100 mg/mL (204.74 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.0474 mL	10.2371 mL	20.4742 mL
5 mM	0.4095 mL	2.0474 mL	4.0948 mL
10 mM	0.2047 mL	1.0237 mL	2.0474 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 110 mg/mL (225.22 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 (5.12 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (5.12 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (5.12 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Bucladesine calcium salt (Dibutyryl-cAMP calcium salt;DC2797 calcium salt) is a cell-permeable cyclic AMP (cAMP) analog and selectively activates cAMP dependent protein kinase (PKA) by increasing the intracellular level of cAMP. Bucladesine calcium salt acts as a phosphodiesterase (PDE) inhibitor.

IC_{50} & Target	PKA	PDE

In Vivo	Bucladesine (bilateral infusion of 10 mM or 100 mM) leads to a significant reduction in escape latency and travel distance (showing an improvement in spatial memory) compared to the control, as assesed by Morris water maze task in male rats. Bucladesine at 1 mM and 5 mM concentrations infused within minutes after 0.5 mg nicotine infusion improves spatial memory retention in male rats[1]. Bucladesine (10 mM/side) combined with Nicotine (0.5 mM/side) results in a significant increase in the ChAT and VAChT immunoreactivity in CA1 regions, and increase in the optical density and amount of ChAT and VAChT immunostaining correlates with the decrease in escape latency and traveled distance in rats treated with Nicotine and low dose of Bucladesine[2]. Bucladesine is absorbed very rapidly and almost completely when the aqueous solution is applied to the site where the skin has been excised. Bucladesine is absorbed rapidly but slower than in the full-thickness abrasion rat model in the case of stripped skin[3]. Bucladesine (single or multiple administration of an emulsion containing 1.5%) is capable of significantly reducing the inflammatory oedema in the arachidonic acid induced ear oedema model in mice[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cell Stem Cell. 2021 Aug 5;28(8):1362-1379.e7.
- Adv Sci (Weinh). 2021 Oct 31;e2100808.
- FASEB J. 2020 Oct;34(10):13376-13395.
- Cell Commun Signal. 2022 Apr 12;20(1):52.
- Front Microbiol. 2021 Aug 17;12:692693.

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REFERENCES

[1]. Sharifzadeh, M., et al., Post-training intrahippocampal infusion of nicotine-bucladesine combination causes a synergistic enhancement effect on spatial memory retention in rats. Eur J Pharmacol, 2007. 562(3): p. 212-20.

[2]. Mafune, E., M. Takahashi, and N. Takasugi, Effect of vehicles on percutaneous absorption of bucladesine (dibutyryl cyclic AMP) in normal and damaged rat skin. Biol Pharm Bull, 1995. 18(11): p. 1539-43.

[3]. Salehi F, et al. Effect of bucladesine, pentoxifylline, and H-89 as cyclic adenosine monophosphate analog, phosphodiesterase, and protein kinase A inhibitor on acute pain. Fundam Clin Pharmacol. 2017 Aug;31(4):411-419.

[4]. Rundfeldt, C., et al., The stable cyclic adenosine monophosphate analogue, dibutyryl cyclo-adenosine monophosphate (bucladesine), is active in a model of acute skin inflammation. Arch Dermatol Res, 2012.

[5]. Shimojo M, et al. The cholinergic gene locus is coordinately regulated by protein kinase A II in PC12 cells. J Neurochem. 1998 Sep;71(3):1118-26.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA