Bucladesine sodium

Cat. No.: HY-B0764

CAS No.: 16980-89-5

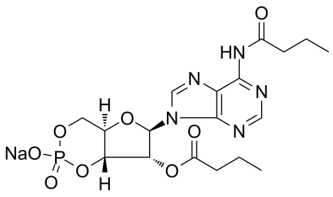
Molecular Formula: $C_{18}H_{23}N_5NaO_8P$

Molecular Weight: 491.37

Target: PKA; Phosphodiesterase (PDE)

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

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

DMSO : 170 mg/mL (345.97 mM; Need ultrasonic)
H_2O : ≥ 50 mg/mL (101.76 mM)
* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	2.0351 mL	10.1756 mL	20.3513 mL
	5 mM	0.4070 mL	2.0351 mL	4.0703 mL
	10 mM	0.2035 mL	1.0176 mL	2.0351 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (203.51 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 4.25 mg/mL (8.65 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 4.25 mg/mL (8.65 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 4.25 mg/mL (8.65 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Bucladesine sodium salt (Dibutyryl-cAMP sodium salt) is a stabilized cyclic AMP (cAMP) analog and a selective PKA activator. Bucladesine sodium salt raises the intracellular levels of cAMP. Bucladesine sodium salt is also a phosphodiesterase (PDE) inhibitor. Bucladesine sodium salt has anti-inflammatory activity and can be used for impaired wound healing[1][2][3][4].

IC_{50} & Target	PKA	PDE

In Vitro	Both choline acetyltransferase (ChAT) and vesicular acetylcholine transporter (VAChT) mRNA increased approximately fourfold after treatment of PC12 cells with Bucladesine (dibutyryl cyclic AMP; dbcAMP). ChAT and PKA activity are also increased by Bucladesine[5]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Intrahippocampal infusion of Bucladesine into the CA1 region (male Albino-Wistar rats) can cause an improvement in spatial memory in maze task. Bilateral infusion of 10 μM and 100 μM Bucladesine leads to a significant reduction in escape latency and travel distance (showing an improvement in spatial memory). Bucladesine via activation of PKA and induction of cAMP/PKA pathway improved spatial memory retention[1]. 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]. 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.

[4]. 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.

[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.

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