# Bucladesine sodium

**Cat. No.:** HY-B0764

**CAS No.:** 16980-89-5

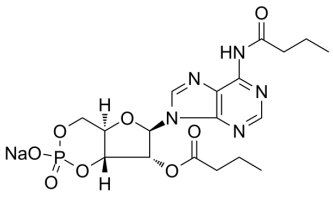
**Molecular Formula:** $C_{18}H_{23}N_5NaO_8P$

**Molecular Weight:** 491.37

**Target:** PKA; Phosphodiesterase (PDE)

**Pathway:** 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 : 125 mg/mL (254.39 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].<br>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].<br>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.
- Cell Commun Signal. 2022 Apr 12;20(1):52.
- Ecotoxicol Environ Saf. 2022 Aug 17;243:113982.
- Int J Mol Sci. 2023 Feb 8;24(4):3398.

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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.





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