Succinyl phosphonate trisodium salt

Cat. No.: HY-12688A

CAS No.: 864167-45-3

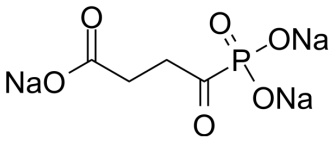
Molecular Formula: $C_4H_4Na_3O_6P$

Molecular Weight: 248.01

Target: Endogenous Metabolite; Reactive Oxygen Species

Pathway: Metabolic Enzyme/Protease; Immunology/Inflammation; NF-κB

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 : 50 mg/mL (201.60 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	4.0321 mL	20.1605 mL	40.3210 mL
5 mM	0.8064 mL	4.0321 mL	8.0642 mL
10 mM	0.4032 mL	2.0160 mL	4.0321 mL

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

In Vivo

1. Add each solvent one by one: PBS
Solubility: 25 mg/mL (100.80 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Succinyl phosphonate trisodium salt is an α-ketoglutarate dehydrogenase (KGDHC) inhibitor, effective inhibits (KGDHC) in muscle, bacterial, brain, and cultured human fibroblasts[1][4]. Succinyl phosphonate trisodium salt is an 2-oxoglutarate dehydrogenase (OGDH) inhibitor, impairs viability of cancer cells in a cell-specific metabolism-dependent manner[2]. Succinyl phosphonate trisodium salt inhibits the glutamate-induced ROS production in glutamate-stimulated hippocampal neurons in situ[3].

IC_{50} & Target

α-ketoglutarate dehydrogenase; 2-oxoglutarate dehydrogenase[1][4]; ROS production[3]

In Vivo

Succinyl phosphonate trisodium salt (0.02 mmol/kg, nasal administration) inhibits 2-oxogglutarate dehydrogenase in rats to reduce the low valley tathione redoxic state, and increases anxiety and interfered with stress adaption[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Redox Biol. 2023 Jun.
- Cancer Res. 2019 Jul 1;79(13):3281-3293.
- Cell Death Dis. 2021 Oct 25;12(11):999.
- Free Radic Biol Med. 2016 Apr 9;96:22-33.
- Planta. 2018 Oct;248(4):963-979.

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REFERENCES

[1]. Artiukhov AV, et al. Increasing Inhibition of the Rat Brain 2-Oxoglutarate Dehydrogenase Decreases Glutathione Redox State, Elevating Anxiety and Perturbing Stress Adaptation. Pharmaceuticals (Basel). 2022 Jan 31;15(2):182.

[2]. Biryukov AI, et al. Succinyl phosphonate inhibits alpha-ketoglutarate oxidative decarboxylation, catalyzed by alpha-ketoglutarate dehydrogenase complexes from E. coli and pigeon breast muscle. FEBS Lett. 1996 Mar 11;382(1-2):167-70.

[3]. Bunik VI, et al. Inhibition of mitochondrial 2-oxoglutarate dehydrogenase impairs viability of cancer cells in a cell-specific metabolism-dependent manner. Oncotarget. 2016 May 3;7(18):26400-21.

[4]. Zündorf G, et al. alpha-Ketoglutarate dehydrogenase contributes to production of reactive oxygen species in glutamate-stimulated hippocampal neurons in situ. Neuroscience. 2009 Jan 23;158(2):610-6.

[5]. Bunik VI, et al. Phosphonate analogues of alpha-ketoglutarate inhibit the activity of the alpha-ketoglutarate dehydrogenase complex isolated from brain and in cultured cells. Biochemistry. 2005 Aug 9;44(31):10552-61.

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