3-Bromopyruvic acid

Cat. No.: HY-19992

CAS No.: 1113-59-3

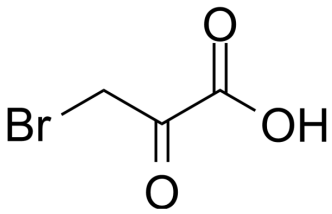
Molecular Formula: $C_3H_3BrO_3$

Molecular Weight: 166.96

Target: Hexokinase; Apoptosis; Autophagy

Pathway: Metabolic Enzyme/Protease; Apoptosis; Autophagy

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 : 250 mg/mL (1497.36 mM; Need ultrasonic)
DMSO : 100 mg/mL (598.95 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	5.9895 mL	29.9473 mL	59.8946 mL
5 mM	1.1979 mL	5.9895 mL	11.9789 mL
10 mM	0.5989 mL	2.9947 mL	5.9895 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 (598.95 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 (14.97 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (14.97 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (14.97 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

3-Bromopyruvate (Bromopyruvic acid) is an analogue of pyruvate and a potent hexokinase (HK)-II inhibitor with high tumor selectivity. 3-Bromopyruvate inhibits cell growth and induces apoptosis through interfering with glycolysis. 3-Bromopyruvate induces autophagy by stimulating ROS formation in breast cancer cells. Antimicrobial activities[1][2][3].

In Vitro

3-Bromopyruvate enhances TRAIL-induced apoptosis in breast cancer cells[2].
3-Bromopyruvate (Bromopyruvic acid), a hexokinase II inhibitor, can induce apoptosis in hepatocellular carcinoma cells by

inducing endoplasmic reticulum (ER) stress[2].
3-Bromopyruvate inhibits ATP generation and upregulates the expression of DR5. 3-Bromopyruvate upregulates CHOP, GRP78 and the phosphorylation of AMPK and augments TRAIL-induced Bax and caspase-3 levels[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[2]

Cell Line:	MCF-7 and MDA-MB-231 cells
Concentration:	40, 80, 160 or 320 μM
Incubation Time:	24 hours
Result:	3-Bromopyruvate (80 and 160 μmol/l) and TRAIL (400 ng/ml) significantly inhibited cell viability.

In Vivo

3-Bromopyruvate (8 mg/kg; i.p.; every 4 days for 28 days) shows a synergistic antitumor effect in MCF-7 cell xenografts in nude mice[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Female nude mice (BALB/c; 4-5-weeks old and 18-20 g)[2]
Dosage:	8 mg/kg
Administration:	I.p.; every 4 days for 28 days
Result:	Showed antitumor efficacy in tumor xenografts.

CUSTOMER VALIDATION

- Cell Stem Cell. 2023 Apr 6;30(4):450-459.e9.
- Cell Death Dis. 2022 Sep 20;13(9):803.
- Arch Toxicol. 2022 Nov;96(11):2913-2926.
- Arch Toxicol. 2022 May 4.
- Neurobiol Dis. 2021 Dec 29;105605.

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REFERENCES

[1]. Gan L, et al. Synergistic Effect of 3-Bromopyruvate in Combination with Rapamycin Impacted Neuroblastoma Metabolism by Inhibiting Autophagy. Onco Targets Ther. 2020;13:11125-11137. Published 2020 Oct 29.

[2]. Chen Y, et al. 3 Bromopyruvate sensitizes human breast cancer cells to TRAIL induced apoptosis via the phosphorylated AMPK mediated upregulation of DR5. Oncol Rep. 2018;40(5):2435-2444.

[3]. Zhang Q, et al. Hexokinase II inhibitor, 3-BrPA induced autophagy by stimulating ROS formation in human breast cancer cells. Genes Cancer. 2014;5(3-4):100-112.

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

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