

# Product data sheet



MedKoo Cat#: 407106 Name: 3-Bromopyruvic acid CAS#: 113-59-3 Chemical Formula: C <sub>3</sub> H <sub>3</sub> BrO <sub>3</sub> Exact Mass: 165.92656 Molecular Weight: 166.96	
Product supplied as: Powder	
Purity (by HPLC): ≥ 98%	
Shipping conditions: Ambient temperature	
Storage conditions: Powder: -20°C 3 years; 4°C 2 years. In solvent: -80°C 3 months; -20°C 2 weeks.	

## 1. Product description:

Bromopyruvic acid is a hexokinase II inhibitor and an effective antitumor agent. The characteristics of 3-bromopyruvate in vitro and in vivo have been reported in the scientific literature since the 1940s. Because it is a highly reactive alkylating agent and it is inherently unstable, it had been described as a metabolic poison. Research at Johns Hopkins has suggested that 3-bromopyruvate could be used to selectively kill cancer cells, while leaving normal cells intact. Recently, the FDA accepted an IND application for the use of 3-bromopyruvate for a Phase I clinical trial in liver cancer. **IMPORTANT NOTE:** this product we are offering is a pure chemical solid powder, which is for research use only, not for human or therapeutic use. Buyer must be a professional and understands how to use and handle the chemical properly.

## 2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under “QC And Documents” section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

## 3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
N/A	N/A	N/A

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	5.99 mL	29.95 mL	59.89 mL
5 mM	1.20 mL	5.99 mL	11.98 mL
10 mM	0.60 mL	2.99 mL	5.99 mL
50 mM	0.12 mL	0.60 mL	1.20 mL

## 5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of “Calculator”

## 6. Recommended literature which reported protocols for in vitro and in vivo study

### In vitro study

- Linke C, Wöslle M, Harder A. Anti-cancer agent 3-bromopyruvate reduces growth of MPNST and inhibits metabolic pathways in a representative in-vitro model. *BMC Cancer*. 2020 Sep 18;20(1):896. doi: 10.1186/s12885-020-07397-w. PMID: 32948135; PMCID: PMC7501688.
- Szczuka I, Wiśniewski J, Kustrzeba-Wójcicka I, Terlecki G. The effect of 3-bromopyruvate on the properties of cathepsin B in the aspect of metastatic potential of colon cancer cells. *Adv Clin Exp Med*. 2020 Aug;29(8):949-957. doi: 10.17219/acem/123622. PMID: 32820873.

### In vivo study

- Liu J, Wang W, Wang L, Qi XM, Sha YH, Yang T. 3-Bromopyruvate alleviates the development of monocrotaline-induced rat pulmonary arterial hypertension by decreasing aerobic glycolysis, inducing apoptosis, and suppressing inflammation. *Chin Med J (Engl)*. 2020 Jan 5;133(1):49-60. doi: 10.1097/CM9.0000000000000577. PMID: 31923104; PMCID: PMC7028200.

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2. Xin Q, Yuan M, Li H, Song X, Lu J, Jing T. In vitro and in vivo effects of 3-bromopyruvate against Echinococcus metacestodes. Vet Res. 2019 Nov 19;50(1):96. doi: 10.1186/s13567-019-0710-7. PMID: 31744550; PMCID: PMC6862786.

## 7. Bioactivity

Biological target:

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N/A

### In vitro activity

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At higher concentrations  $> 60 \mu\text{M}$  3-BrPA (3-Bromopyruvic acid), a reduction of ROS was seen in B8y fibroblasts (Fig. 3a). B8vc fibroblasts which should have a controlled rate of ROS production displayed a much higher reduction of ROS levels at increasing 3-BrPA concentrations compared to PA28y overexpressing cells (Fig. 3a). The  $p$  values were  $\leq 0.036$  in the concentration range of 80 to 120  $\mu\text{M}$ . The decrease of  $\Delta F U_{norm}$  under 3-BrPA therapy indicates a decrease of ROS production presumably due to mitochondrial complex I and III dysfunctions, and PA28y overexpression seems to temper the effect of 3-BrPA while normal fibroblasts seem to be more sensitive.

Reference: BMC Cancer. 2020; 20: 896. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7501688/>

### In vivo activity

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The effects of 3-BrPA (3-Bromopyruvic acid) on apoptosis in MCT rats were further examined by measuring the changes in the expression of apoptosis-associated proteins. The amount of cleaved Casp 3 protein expression was increased in the 3-BrPA treatment MCT rats [Figure 7A]. Furthermore, this study observed decreased Cyto C in mitochondria [Figure 7B] and increased the release of Cyto C into the cytoplasm in the 3-BrPA-treated MCT rats compared to those of PBS-treated MCT rats [Figure 7C]. These results show that 3-BrPA leads to the activation of the mitochondrial apoptotic signaling pathway.

Reference: Chin Med J (Engl). 2020 Jan 5; 133(1): 49–60. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7028200/>

*Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.*