

# Product data sheet



MedKoo Cat#: 574070 Name: L-Buthionine sulfoximine CAS: 83730-53-4 Chemical Formula: C <sub>8</sub> H <sub>18</sub> N <sub>2</sub> O <sub>3</sub> S Exact Mass: 222.1038 Molecular Weight: 222.303	
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:

L-Buthionine sulfoximine is an irreversible  $\gamma$ -glutamylcysteine synthetase ( $\gamma$ -GCS) inhibitor that depletes glutathione levels by inhibiting synthesis. L-Buthionine sulfoximine also induces ferroptosis in vitro.

## 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
DMSO	22.23	100.0
PBS (pH 7.2)	5.0	22.49
Water	26.85	120.80

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	4.50 mL	22.49 mL	44.98 mL
5 mM	0.90 mL	4.50 mL	9.00 mL
10 mM	0.45 mL	2.25 mL	4.50 mL
50 mM	0.09 mL	0.45 mL	0.90 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

1. Nishizawa S, Araki H, Ishikawa Y, Kitazawa S, Hata A, Soga T, Hara T. Low tumor glutathione level as a sensitivity marker for glutamate-cysteine ligase inhibitors. *Oncol Lett.* 2018 Jun;15(6):8735-8743. doi: 10.3892/ol.2018.8447. Epub 2018 Apr 10. PMID: 29928324; PMCID: PMC6004701.

2. Fruehauf JP, Zonis S, al-Bassam M, Kyshtoobayeva A, Dasgupta C, Milovanovic T, Parker RJ, Buzaid AC. Selective and synergistic activity of L-S,R-buthionine sulfoximine on malignant melanoma is accompanied by decreased expression of glutathione-S-transferase. *Pigment Cell Res.* 1997 Aug;10(4):236-49. doi: 10.1111/j.1600-0749.1997.tb00490.x. PMID: 9263331.

### In vivo study

1. Yu M, Liu Y, Duan Y, Chen Y, Han J, Sun L, Yang X. Inhibition of glutathione production by L-S,R-buthionine sulfoximine activates hepatic ascorbate synthesis - A unique anti-oxidative stress mechanism in mice. *Biochem Biophys Res Commun.* 2017 Feb 26;484(1):56-63. doi: 10.1016/j.bbrc.2017.01.072. Epub 2017 Jan 20. PMID: 28115164.

2. Reliene R, Schiestl RH. Glutathione depletion by buthionine sulfoximine induces DNA deletions in mice. *Carcinogenesis.* 2006 Feb;27(2):240-4. doi: 10.1093/carcin/bgi222. Epub 2005 Sep 14. PMID: 16162646.

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## 7. Bioactivity

### Biological target:

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L-Buthionine-(S,R)-sulfoximine is a cell-permeable, potent, fast acting and irreversible inhibitor of g-glutamylcysteine synthetase and depletes cellular glutathione levels.

### In vitro activity

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BSO (L-Buthionine-(S,R)-sulfoximine) was demonstrated to suppress glutathione levels and induce lipid peroxidation, thereby inhibiting cell viability. The viability-reducing effects of BSO were attenuated by ferroptosis inhibition and enhanced by iron, indicating that BSO induced ferroptosis in cancer cells.

Reference: Oncol Lett. 2018 Jun;15(6):8735-8743. <https://pubmed.ncbi.nlm.nih.gov/29928324/>

### In vivo activity

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Indeed, administration of L-S,R-BSO (L-Buthionine sulfoximine) to mice inhibited tissue GSH production while increasing ascorbate levels. L-S,R-BSO also increased tissue ascorbate levels in mice fed a ascorbate and dehydroascorbate-free diet suggesting activation of ascorbate synthesis, which was further confirmed by increased urinary ascorbate excretion. Other reagents inhibiting GSH production also increased tissue ascorbate levels.

Reference: Biochem Biophys Res Commun. 2017 Feb 26;484(1):56-63. <https://pubmed.ncbi.nlm.nih.gov/28115164/>

*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.*