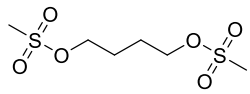
Product data sheet

MedKoo Cat#: 100110 Name: Busulfan CAS#: 55-98-1 Chemical Formula: $C_6H_{14}O_6S_2$ Exact Mass: 246.02318 Molecular Weight: 246.3	
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:

Busulfan (Myleran, GlaxoSmithKline, Busulfex IV, Otsuka America Pharmaceutical, Inc.) is a cancer drug, in use since 1959. Busulfan is a cell cycle non-specific alkylating antineoplastic agent, in the class of alkyl sulfonates. Its chemical designation is 1,4-butanediol dimethanesulfonate.

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	38.57	156.60
DMSO:PBS (pH 7.2) (1:1)	0.5	2.03
DMF	16.7	67.80
Water	1.0	4.06

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	4.06 mL	20.30 mL	40.60 mL
5 mM	0.81 mL	4.06 mL	8.12 mL
10 mM	0.41 mL	2.03 mL	4.06 mL
50 mM	0.08 mL	0.41 mL	0.81 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. Qiao J, Wu Y, Liu Y, Li X, Wu X, Liu N, Zhu F, Qi K, Cheng H, Li D, Li H, Li Z, Zeng L, Ma P, Xu K. Busulfan Triggers Intrinsic Mitochondrial-Dependent Platelet Apoptosis Independent of Platelet Activation. Biol Blood Marrow Transplant. 2016 Sep;22(9):1565-1572. doi: 10.1016/j.bbmt.2016.06.006. Epub 2016 Jun 9. PMID: 27292166.
2. Mei Q, Li F, Quan H, Liu Y, Xu H. Busulfan inhibits growth of human osteosarcoma through miR-200 family microRNAs in vitro and in vivo. Cancer Sci. 2014 Jul;105(7):755-62. doi: 10.1111/cas.12436. Epub 2014 Jul 3. PMID: 24815002; PMCID: PMC4317920.

In vivo study

1. Leonard A, Yapundich M, Nassehi T, Gamer J, Drysdale CM, Haro-Mora JJ, Demirci S, Hsieh MM, Uchida N, Tisdale JF. Low-Dose Busulfan Reduces Human CD34+ Cell Doses Required for Engraftment in c-kit Mutant Immunodeficient Mice. Mol Ther Methods Clin Dev. 2019 Nov 11;15:430-437. doi: 10.1016/j.omtm.2019.10.017. PMID: 31890735; PMCID: PMC6909187.

2. Guo X, Yin X, Zhu W, Pan Y, Wang H, Liang Y, Zhu X. The Preconditioning of Busulfan Promotes Efficiency of Human CD133+ Cells Engraftment in NOD Shi-SCID IL2Rγcnull (NOG) Mice via Intra-Bone Marrow Injection. Cell Transplant. 2019 Jul;28(7):973-979. doi: 10.1177/0963689719842162. Epub 2019 Apr 15. PMID: 30983406; PMCID: PMC6719503.

7. Bioactivity

Biological target:

Busulfan is a potent alkylator with selective immunosuppressive effect on bone marrow.

In vitro activity

To further confirm the role of busulfan in platelet apoptosis, antiapoptotic molecule Bcl-2 and proapoptotic molecule Bax, as well as activation of caspase-3, were measured in platelets after busulfan treatment. Consistent with busulfan-induced increased mitochondrial membrane depolarization, significantly reduced expression of Bcl-2, increased expression of Bax, and activation of caspase-3 were observed in platelet treated with busulfan in a dose-dependent manner compared with in vehicle-treated platelets (Figure 3), suggesting busulfan induces platelet apoptosis through regulation of the expression of Bcl-2 and Bax, leading to subsequent increased caspase-3 activation.

Reference: Biol Blood Marrow Transplant. 2016 Sep;22(9):1565-1572. https://www.astctjournal.org/article/S1083-8791(16)30137-9/fulltext

In vivo activity

With busulfan preconditioning, the proportion of human $CD45^+$ leukocytes, various human lymphocytes subsets, DCs and the ratio of $CD4^+$ to $CD8^+$ cells in peripheral blood of NOG mice were significantly higher than those of the untreated group ($P < 0.05$). Moreover, two subsets of monocytes, classic ($CD14^+$ $CD16^-$) and non-classic ($CD14^+$ $CD16^+$), were also differentiated and showed a significant difference between the two groups ($P < 0.05$).

Reference: Cell Transplant. 2019 Jul; 28(7): 973–979. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6719503/

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.