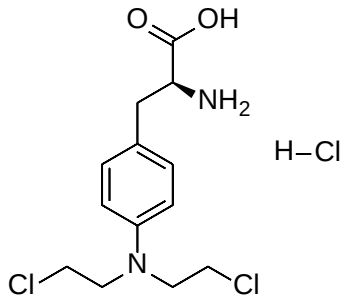
Product data sheet

MedKoo Cat#: 100580 Name: Melphalan Hydrochloride CAS: 3223-07-2 Chemical Formula: $C_{13}H_{19}Cl_3N_2O_2$ Molecular Weight: 341.657	
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:
Melphalan is an orally available phenylalanine derivative of nitrogen mustard with antineoplastic activity. Melphalan alkylates DNA at the N7 position of guanine and induces DNA inter-strand cross-linkages, resulting in the inhibition of DNA and RNA synthesis and cytotoxicity against both dividing and non-dividing tumor cells.

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
TBD	TBD	TBD

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.93 mL	14.63 mL	29.27 mL
5 mM	0.59 mL	2.93 mL	5.85 mL
10 mM	0.29 mL	0.59 mL	2.93 mL
50 mM	0.06 mL	0.29 mL	0.59 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. Liu R, Li D, Sun F, Rampoldi A, Maxwell JT, Wu R, Fischbach P, Castellino SM, Du Y, Fu H, Mandawat A, Xu C. Melphalan induces cardiotoxicity through oxidative stress in cardiomyocytes derived from human induced pluripotent stem cells. Stem Cell Res Ther. 2020 Nov 5;11(1):470. doi: 10.1186/s13287-020-01984-1. PMID: 33153480; PMCID: PMC7643439.

2. Amory JK, Hong S, Yu X, Muller CH, Faustman E, Goldstein A. Melphalan, alone or conjugated to an FSH-β peptide, kills murine testicular cells in vitro and transiently suppresses murine spermatogenesis in vivo. Theriogenology. 2014 Jul 1;82(1):152-9. doi: 10.1016/j.theriogenology.2014.03.014. Epub 2014 Mar 27. PMID: 24746827; PMCID: PMC4079550.

In vivo study

1. Wardill HR, de Mooij CEM, da Silva Ferreira AR, van de Peppel IP, Havinga R, Harmsen HJM, Tissing WJE, Blijlevens NMA. Translational model of melphalan-induced gut toxicity reveals drug-host-microbe interactions that drive tissue injury and fever. Cancer Chemother Pharmacol. 2021 Aug;88(2):173-188. doi: 10.1007/s00280-021-04273-7. Epub 2021 Apr 20. PMID: 33877390; PMCID: PMC8236460.

2. Chai RC, McDonald MM, Terry RL, Kovačić N, Down JM, Pettitt JA, Mohanty ST, Shah S, Haffari G, Xu J, Gillespie MT, Rogers MJ, Price JT, Croucher PI, Quinn JMW. Melphalan modifies the bone microenvironment by enhancing osteoclast formation. Oncotarget. 2017 Jul 10;8(40):68047-68058. doi: 10.18632/oncotarget.19152. PMID: 28978095; PMCID: PMC5620235.

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7. Bioactivity

Biological target:

Melphalan is an orally available phenylalanine derivative of nitrogen mustard with antineoplastic activity.

In vitro activity

The ability of conjugates of melphalan and FSHβ peptides to kill murine testicular cells was first tested in vitro in a three-dimensional testicular cell coculture system. In this system, melphalan caused considerable cell death as measured both by increases in lactate dehydrogenase concentrations in the culture supernatant and direct visualization of the cultures. Of the conjugates tested, melphalan conjugated to a 20-amino acid peptide derived from human FSHβ consisting of amino acids 33 to 53 (FSHβ (33-53)-melphalan) was very potent, with cell cytotoxicity and lactate dehydrogenase release roughly one-half that of melphalan.

Reference: Theriogenology. 2014 Jul 1;82(1):152-9. https://pubmed.ncbi.nlm.nih.gov/24746827/

In vivo activity

Male Wistar rats were treated with 4-8 mg/kg melphalan intravenously. Melphalan 5 mg/kg caused self-limiting intestinal injury, severe neutropenia and fever while impairing the microbial metabolome, prompting expansion of enteric pathogens.

Reference: Cancer Chemother Pharmacol. 2021 Aug;88(2):173-188. https://pubmed.ncbi.nlm.nih.gov/33877390/

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.