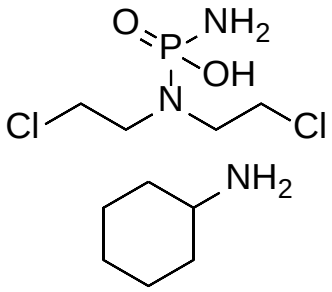
Product data sheet

MedKoo Cat#: 464713 Name: PMC CAS: 1566-15-0 (cyclohexylammonium salt) Chemical Formula: $C_{10}H_{24}Cl_2N_3O_2P$ Exact Mass: 319.0983 Molecular Weight: 320.1948	
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:
Phosphoramide mustard (PMC) is an alkylating agent and active metabolite of cyclophosphamide. It is formed from cyclophosphamide via the ring-opened tautomer of the cytochrome P450 (CYP) isoform-formed intermediate 4-hydroxycyclophosphamide. Phosphoramide mustard induces DNA crosslinking, alkylates guanine in DNA, and increases the production of covalent DNA-protein conjugates in, and is cytotoxic to, HT-1080 human fibrosarcoma cells in a concentration-dependent manner. It is toxic to adult mice and teratogenic to embryos when administered to pregnant dams at a dose of 154 mg/kg on day 11 of gestation.

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
Water	100.0	312.31

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.12 mL	15.62 mL	31.23 mL
5 mM	0.62 mL	3.12 mL	6.25 mL
10 mM	0.31 mL	1.56 mL	3.12 mL
50 mM	0.06 mL	0.31 mL	0.62 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. Madden JA, Thomas PQ, Keating AF. Phosphoramide mustard induces autophagy markers and mTOR inhibition prevents follicle loss due to phosphoramide mustard exposure. Reprod Toxicol. 2017 Jan;67:65-78. doi: 10.1016/j.reprotox.2016.11.014. Epub 2016 Nov 22. PMID: 27888070.
2. Ganesan S, Keating AF. Phosphoramide mustard exposure induces DNA adduct formation and the DNA damage repair response in rat ovarian granulosa cells. Toxicol Appl Pharmacol. 2015 Feb 1;282(3):252-8. doi: 10.1016/j.taap.2014.11.017. Epub 2014 Dec 9. PMID: 25497287; PMCID: PMC5044804.

In vivo study

1. Clark KL, Keating AF. Ataxia-telangiectasia mutated coordinates the ovarian DNA repair and atresia-initiating response to phosphoramide mustard. Biol Reprod. 2020 Feb 12;102(1):248-260. doi: 10.1093/biolre/ioz160. PMID: 31435664.
2. Ganesan S, Nteeba J, Madden JA, Keating AF. Obesity alters phosphoramide mustard-induced ovarian DNA repair in mice. Biol Reprod. 2017 Feb 1;96(2):491-501. doi: 10.1095/biolreprod.116.143800. PMID: 28203708; PMCID: PMC6366544.

Product data sheet

7. Bioactivity

Biological target:

Phosphoramide mustard (PMC) is an alkylating agent and active metabolite of cyclophosphamide.

In vitro activity

To investigate whether PM (phosphoramide mustard) induces DNA adduct formation, DNA damage and induction of the DNA repair response, rat spontaneously immortalized granulosa cells (SIGCs) were treated with vehicle control (1% DMSO) or PM (3 or 6μM) for 24 or 48h. Cell viability was reduced ($P<0.05$) after 48h of exposure to 3 or 6μM PM. The NOR-G-OH DNA adduct was detected after 24h of 6μM PM exposure, while the more cytotoxic G-NOR-G DNA adduct was formed after 48h by exposure to both PM concentrations.

Reference: Toxicol Appl Pharmacol. 2015 Feb 1;282(3):252-8. https://pubmed.ncbi.nlm.nih.gov/25497287/

In vivo activity

In WT mice, PM (phosphoramide mustard) increased 162 and decreased 20 proteins. In Atm+/- mice, 173 and 37 proteins were increased and decreased, respectively, by PM. Exportin-2 (XPO2) was localized to granulosa cells of all follicle stages and was 7.2-fold greater in Atm+/- than WT mice. Cytoplasmic FMR1-interacting protein 1 was 6.8-fold lower in Atm+/- mice and was located in the surface epithelium with apparent translocation to the ovarian medulla post-PM exposure. PM induced γH2AX, but fewer γH2AX-positive foci were identified in Atm+/- ovaries. Similarly, cleaved caspase-3 was lower in the Atm+/- PM-treated, relative to WT mice.

Reference: Biol Reprod. 2020 Feb 12;102(1):248-260. https://pubmed.ncbi.nlm.nih.gov/31435664/

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.