Cyclophosphamide hydrate

Cat. No.: HY-17420A

CAS No.: 6055-19-2

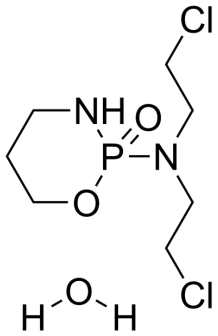
Molecular Formula: $C_7H_{17}Cl_2N_2O_3P$

Molecular Weight: 279.1

Target: DNA Alkylator/Crosslinker

Pathway: Cell Cycle/DNA Damage

Storage: Powder -20°C 3 years
4°C 2 years
* The compound is unstable in solutions, freshly prepared is recommended.



SOLVENT & SOLUBILITY

In Vitro

H_2O : ≥ 50 mg/mL (179.15 mM)
DMSO : ≥ 38 mg/mL (136.15 mM)
* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Concentration / Solvent / Mass	1 mg	5 mg	10 mg
1 mM	3.5829 mL	17.9147 mL	35.8295 mL
5 mM	0.7166 mL	3.5829 mL	7.1659 mL
10 mM	0.3583 mL	1.7915 mL	3.5829 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 25 mg/mL (89.57 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (8.96 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (8.96 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (8.96 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Cyclophosphamide hydrate is a synthetic alkylating agent chemically related to the nitrogen mustards with antineoplastic and immunosuppressive activities.

In Vitro

Cyclophosphamide induces outer membrane blebbing, leads to DNA fragmentation, as revealed by TUNEL staining of free

	3'-OH DNA ends, and induces cleavage of the caspase 3 and caspase 7 substrate PARP in 9L/P450 cells. Bcl-2 expression fully blocks the activation of both initiator caspases as well as the effector caspase 3 in cells treated with activated Cyclophosphamide. Bcl-2 inhibits the cytotoxic effects but not the cytostatic effects of activated Cyclophosphamide[1]. Cyclophosphamide inhibits the AChE reversibly with an IC_{50} of 511 μM[2]. Carbon tetrachloride does not affect the direct cytotoxicity of cyclophosphamide or 4-hydroxycyclophosphamide to cells in culture[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Cyclophosphamide (injected i.p.;2mg/mouse in 0.1 mL PBS, in C3H mice bearing SW1 tumors) increases the percentage of cells that stained for CD3, CD4 or CD8 in both spleens and tumors[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Six to eight-week old female C3H/HeN mice bearing SW1 tumors[4]
Dosage:	2 mg/mouse
Administration:	Injected i.p.; 2mg/mouse in 0.1 mL PBS; Four days
Result:	Increased the percentage of cells that stained for CD3, CD4 or CD8 in both spleens and tumors.

CUSTOMER VALIDATION

- Nat Commun. 2023 Apr 13;14(1):2109.
- Nat Commun. 2021 Jan 4;12(1):20.
- J Clin Invest. 2024 Mar 7:e172716.
- Cell Death Dis. 2020 Nov 12;11(11):976.
- Life Sci. 2020 Aug 1;254:117590.

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REFERENCES

[1]. Schwartz PS, et al. Cyclophosphamide induces caspase 9-dependent apoptosis in 9L tumor cells. Mol Pharmacol. 2001 Dec;60(6):1268-1279.

[2]. al-Jafari AA, et al. Inhibition of human acetylcholinesterase by cyclophosphamide. Toxicology. 1995 Jan 19;96(1):1-6.

[3]. Harris RN, et al. Carbon tetrachloride-induced increase in the antitumor activity of cyclophosphamide in mice: a pharmacokineticstudy. Cancer Chemother Pharmacol. 1984;12(3):167-72.

[4]. Liu P, et al. Administration of cyclophosphamide changes the immune profile of tumor-bearing mice. J Immunother. 2010 Jan;33(1):53-9.

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