Ifosfamide

Cat. No.: HY-17419

CAS No.: 3778-73-2

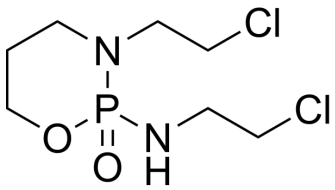
Molecular Formula: $C_7H_{15}Cl_2N_2O_2P$

Molecular Weight: 261.09

Target: DNA Alkylator/Crosslinker

Pathway: Cell Cycle/DNA Damage

Storage: 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 50 mg/mL (191.50 mM)
* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.8301 mL	19.1505 mL	38.3010 mL
5 mM	0.7660 mL	3.8301 mL	7.6602 mL
10 mM	0.3830 mL	1.9150 mL	3.8301 mL

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

In Vivo

1. Add each solvent one by one: 0.5% CMC-Na/saline water
   Solubility: 25 mg/mL (95.75 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 (9.58 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (9.58 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (9.58 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Ifosfamide is an alkylating chemotherapeutic agent with activity against a wide range of tumors.

IC_{50} & Target

DNA Alkylator[1]

In Vitro

Ifosfamide is an alkylating chemotherapeutic agent with activity against a wide range of tumors[1].
Ifosfamide is activated by the cytochrome P450 family. Ifosfamide (0-5 mM) suppresses the viability of CYP2B1-expressing

	C8III-1 cells, while it is cytotoxic to the non-CYP2B1-expressing CrFK cells only at high concentration (5 mM)[2]. CYP BM3 mutants activates Ifosfamide, and Ifosfamide shows inhibitory activity against human U2OS cells[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Ifosfamide (50 mg/kg, i.p.) treatment before mating increases percentage of post-implantation loss and resorbs fetuses in pregnant rats. Ifosfamide also (50 mg/kg, i.p.) decreases the progesterone in the serum of pregnant rats. However, Ifosfamide causes no obvious difference with the control rats at 25 mg/kg. Ifosfamide (25, 50 mg/kg, i.p.) induces apoptosis and histological changes in the placentas and prenatal rats, most sensitive fetal organs are the brain, liver and kidney[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	In a 3-cm dish, 4×10^4 cells are seeded in 2 mL of medium. The next day, Ifosfamide is added to final concentrations from 0 to 5 mM. After six additional days the medium is removed, the cells washed with PBS, and either stained or counted[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [1]	Rats[1] Prior to mating, female rats are divided into four groups of eight: group 1, untreated negative controls; group 2, rats injected i.p. with 1 mL 0.9% NaCl; group 3, rats injected i.p. with 25 mg/kg Ifosfamide; group 4, rats injected i.p. with 50 mg/kg Ifosfamide. After injection of Ifosfamide once daily for 5 consecutive days, three females are placed in a cage with one untreated male for up to 1 week. Vaginal smears are examined daily to determine pregnancy. The first 24 h period following mating is designated day one of pregnancy if sperm are detected. The pregnant females are housed singly and observed daily for signs of toxicity and abortion. All pregnant animals are sacrificed by decapitation on day 18 of gestation. Cardiac blood (2.5 -3 mL/rat) is collected in nonheparinized test tubes, centrifuged at 3,000× g for 30 min and the serum is decanted and stored at -70°C until used for hormone assay. After blood collection, uteri and both ovaries are removed, washed in saline solution and the corpora lutea of pregnancy are counted visually, and the number of implantation sites, resorption sites and viable fetuses are counted in each uterine horn. Each fetus is removed from its umbilical cord, weighed and the crown rump (CR) length is measured. Fetuses are examined for external malformation and the placental weights are recorded. Fetuses and placentas of control and treated groups are fixed in 10% neutral buffered formalin for immunohistochemical and histological examination[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cell Res. 2020 Oct;30(10):833-853.
- Theranostics. 2020 Jul 25;10(21):9477-9494.
- J Mol Med (Berl). 2019 Aug;97(8):1183-1193.
- Breast Cancer Res Treat. 2023 May 19.
- J Bone Oncol. October 2021, 100391.

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REFERENCES

[1]. Helal M. Prenatal effects of transplacental exposure to ifosfamide in rats. Biotech Histochem. 2016 Jul;91(5):357-68.

[2]. Karle P, et al. Necrotic, rather than apoptotic, cell death caused by cytochrome P450-activated ifosfamide. Cancer Gene Ther. 2001 Mar;8(3):220-30.

[3]. Vredenburg G, et al. Activation of the anticancer drugs cyclophosphamide and ifosfamide by cytochrome P450 BM3 mutants. Toxicol Lett. 2015 Jan 5;232(1):182-92.

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