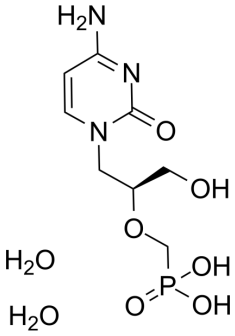
Cidofovir dihydrate

Cat. No.:	HY-17438A
CAS No.:	149394-66-1
Molecular Formula:	$C_8H_{18}N_3O_8P$
Molecular Weight:	315.22
Target:	CMV; Endogenous Metabolite; DNA/RNA Synthesis; Apoptosis; Orthopoxvirus
Pathway:	Anti-infection; Metabolic Enzyme/Protease; Cell Cycle/DNA Damage; Apoptosis
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Cidofovir (GS 0504; HPMPC; (S)-HPMPC) dihydrate is an acyclic monophosphate nucleotide analogue and CMV inhibitor with antiviral activity. Cidofovir dihydrate inhibits cytomegalovirus (CMV) replication by selectively inhibiting viral DNA polymerase. Cidofovir dihydrate induces apoptosis and can be used in studies of AIDS cytomegalovirus retinitis, herpes, and cancer[1][3]. Cidofovir dihydrate also has anti-orthopoxvirus and anti-variola activities[4].

In Vitro

Cidofovir (5-100 μM, 72 hours) dihydrate has antiviral activity against feline herpesvirus type-1 (FHV-1) with an IC_{50} of 11 μM, and can reduce Crandell-Reese feline kidney cells counts in a dose dependent manner[1].
Cidofovir (10-1000 μM, 24-120 hours) dihydrate can reduce cancer cell viability and induces apoptosis[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Cytotoxicity Assay[1]

Cell Line:	Crandell-Reese feline kidney(CRFK) cells
Concentration:	10-100 μM
Incubation Time:	72 hours
Result:	Reduced CRFK cells by 9.1%.

Cell Viability Assay[3]

Cell Line:	Caco-2, FTC-133, HeLa, Hep-G2, MDA-MB-231, NCI-H1975 and PC-3 cells
Concentration:	10-1000 μM
Incubation Time:	24, 48, 72, 96, 120 hours
Result:	Resulted in a gradual decrease in tumor cell viability with time and concentration increasing and inhibited the number of FTC-133 cell clones by about 55% at 100 μM comparing to the untreated group.

Apoptosis Analysis[3]

Cell Line:	FTC-133 cells

Concentration:	100 μM
Incubation Time:	96 hours
Result:	Showed a significant increase in the expression of pro-apoptotic proteins, such as cytochrome c, phospho-p53 (S15) and caspase-3 by 130%, 49%, and 46%, respectively while the anti-apoptotic protein Bcl-x decreased significantly by 57% comparing to the untreated cells.

In Vivo

Cidofovir (subcutaneous injection, 100 mg/kg, 3-6 days interval, 21 days) dihydrate is highly protective against death from cowpox virus (CPV) infection at high doses in female weanling BALB/c mice[2].

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Animal Model:	Female weanling BALB/c mice infected with cowpox virus (CPV)[2]
Dosage:	100 mg/kg
Administration:	Subcutaneous injection; 3-6 days interval; 21 days
Result:	Prevented 80-100% of mouse deaths when administered on the first 4-3 days before infection. Protected 35-50% of mice when administered on the fourth day after infection, and 10-20% when administered on the sixth day.

CUSTOMER VALIDATION

- Emerg Microbes Infect. 2023 May 2;2208682.
- Viruses. 2021, 13(10), 2102.

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REFERENCES

[1]. David J Maggs, et al. In vitro efficacy of ganciclovir, cidofovir, penciclovir, foscarnet, idoxuridine, and acyclovir against feline herpesvirus type-1. Am J Vet Res. 2004 Apr;65(4):399-403.

[2]. M Bray, et al. Cidofovir protects mice against lethal aerosol or intranasal cowpox virus challenge. J Infect Dis. 2000 Jan;181(1):10-9.

[3]. Simona Catalani, et al. Reduced cell viability and apoptosis induction in human thyroid carcinoma and mesothelioma cells exposed to cidofovir. Toxicol In Vitro. 2017 Jun;41:49-55.

[4]. Robert O Baker, et al. Potential antiviral therapeutics for smallpox, monkeypox and other orthopoxvirus infections. Antiviral Res. 2003 Jan;57(1-2):13-23.

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