Product Data Sheet

Product Name: Cidofovir dihydrate
Cat. No.: GC13936

Chemical Properties

Cas. No.	149394-66-1		
Chemical Name	[(2S)-1-(4-amino-2-oxopyrimidin-1-yl)-3-hydroxypropan-2-yl]oxymethylphosphonic acid;dihydrate		
SMILES	C1=CN(C(=O)N=C1N)CC(CO)OCP(=O)(O)O.O.O		
Formula	$C_8H_{18}N_3O_8P$	M.Wt	315.22
Solubility	≥ 34.6mg/mL in Water with gentle warming	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	Cidofovir dihydrate		

Protocol

Cell experiment [1]:

Cell lines	MA104 cells (monkey kidney epithelial cell line)

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Preparation Method	MA104 cells were maintained in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% fetal bovine serum (FBS) at 37°C, 5% CO_2. For antiviral evaluation, MA104 cells in 12-well plates were treated with Cidofovir dihydrate (400μM, 200μM, 100μM, 50μM) for 6 hours before infection and then incubated with Human Bocavirus 1 (HBoV1) for 12 hours. After infection, cells were washed and cultured in fresh medium with or without Cidofovir dihydrate for the indicated duration.
Reaction Conditions	50-400μM; 6h pretreatment.
Applications	Cidofovir dihydrate treatment resulted in a dose-dependent reduction in intracellular HBoV1 DNA copies compared to the untreated control.

Animal experiment [2]:

Animal models	Athymic nu/nu mice (homozygous)
Preparation Method	Female athymic mice (5-6 weeks old) received intracerebral injection of 300,000 U87MG or SF7796 glioblastoma (GBM) cells into the right striatum to establish intracranial xenograft tumors. Mice were treated intraperitoneally (i.p.) with Cidofovir dihydrate at 100mg/kg, 3 times per week. Bioluminescence imaging was used to monitor tumor growth.
Dosage form	100mg/kg; i.p.; 3 times/week.

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Applications	Cidofovir dihydrate treatment significantly delayed or prevented intracranial GBM tumor development, as evidenced by reduced bioluminescence signal, and significantly extended the survival of tumor-bearing mice compared to the vehicle-only control group. In tumors, Cidofovir dihydrate induced extensive apoptosis, and promoted DNA double-stranded breaks.

References:

[1] Tang J, Chen S, Deng Y, et al. MA104 cell line is permissive for human bocavirus 1 infection. J Virol. 2025 Feb 25;99(2):e0153924.

[2] Hadaczek P, Ozawa T, Soroceanu L, et al. Cidofovir: a novel antitumor agent for glioblastoma. Clin Cancer Res. 2013 Dec 1;19(23):6473-83.

Background

Cidofovir dihydrate is an acyclic monophosphate nucleotide analog, a CMV inhibitor, possessing antiviral activity[1-2]. Cidofovir dihydrate selectively inhibits viral DNA polymerase, thereby inhibiting cytomegalovirus replication and inducing apoptosis. Cidofovir dihydrate can be used in antiviral and cancer treatment-related research[3-4].

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In vitro, MA104 cells were pretreated with Cidofovir dihydrate (50-400μM) for 6 hours, followed by infection with Human Bocavirus 1 (HBoV1) for 12 hours. Cidofovir dihydrate significantly inhibited HBoV1 replication, resulting in a dose-dependent reduction in viral DNA copy number[5]. HBoV1-HiBiTNS1-transfected HEK293T-LgBiT cells were treated with Cidofovir dihydrate (200μM) for 72 hours. Cidofovir dihydrate inhibited HBoV1 replicative activity[6].

In vivo, in an intracranial glioblastoma (GBM) xenograft mouse model, Cidofovir dihydrate (100mg/kg; intraperitoneal injection; 3 times per week) significantly extended the survival of tumor-bearing mice, induced apoptosis in tumor cells, and promoted DNA double-strand breaks while activating the p53 and Fas/TNFα-Trail pathways[7]. In a Monkeypox virus (MPXV) systemic dissemination SCID mouse model, early post-exposure administration of Cidofovir dihydrate (100mg/kg; subcutaneous injection; 2 times per week) on the day of infection or within 2 days post-infection significantly inhibited viral replication in organs such as the lungs, liver, and spleen, and alleviated histopathological damage[8].

References:
[1] Maggs DJ, Clarke HE. 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] Bray M, Martinez M, Smee DF, et al. Cidofovir protects mice against lethal aerosol or intranasal cowpox virus challenge. J Infect Dis. 2000 Jan;181(1):10-9.
[3] Kendle JB, Fan-Havard P. Cidofovir in the treatment of cytomegaloviral disease. Ann Pharmacother. 1998 Nov;32(11):1181-92.
[4] Stafford A, Rimmer S, Gilchrist M, et al. Use of cidofovir in a patient with severe mpox and uncontrolled HIV infection. Lancet Infect Dis. 2023 Jun;23(6):e218-e226.
[5] Tang J, Chen S, Deng Y, et al. MA104 cell line is permissive for human bocavirus 1 infection. J Virol. 2025 Feb 25;99(2):e0153924.
[6] Tang J, Chen S, Zhong Y, et al. Development of a reporter HBoV1 strain for antiviral drug screening and life cycle studies. Virol Sin. 2025 Apr;40(2):275-283.
[7] Hadaczek P, Ozawa T, Soroceanu L, et al. Cidofovir: a novel antitumor agent for glioblastoma. Clin Cancer Res. 2013 Dec 1;19(23):6473-83.
[8] Cao X, Shi N, Qiu X, et al. Intervention timing and disease stage shape tecovirimat and cidofovir efficacy in male SCID mice. Nat Commun. 2025 Dec 18;17(1):843.

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