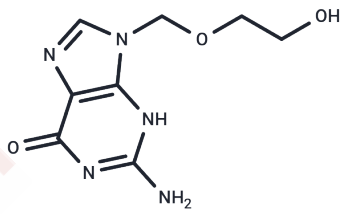
Data Sheet (Cat.No.T1454)

TargetMol

Acyclovir

Chemical Properties



CAS No. : 59277-89-3

Formula: C8H11N5O3

Molecular Weight: 225.2

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	Acyclovir (Aciclovir) is a guanine analog and orally active antiviral agent characterized by a narrow antiviral spectrum, high selectivity, and low toxicity. Acyclovir exhibits activity against HSV-1 (IC50 = 0.85 μM), HSV-2 (IC50 = 0.86 μM), and varicella-zoster virus. Acyclovir can be used for herpesvirus treatment research.
Targets(IC50)	Apoptosis,Antibacterial,Antibiotic,HSV,DNA/RNA Synthesis
In vitro	**Methods**: Flow cytometry was used to analyze the cell cycle distribution of Jurkat cells treated with 10 and 100 μM acyclovir at 24, 48, and 72 hours. **Results**: Acyclovir induced S-phase arrest in Jurkat cells, and the sub-G1 apoptotic peak was significantly elevated at 72 hours. [4] **Methods**: Cell viability of Jurkat, U937, and K562 leukemia cells treated with 3-100 μM acyclovir for 24, 48, and 72 hours was assessed using the trypan blue staining Methods. **Results**: Acyclovir inhibited Jurkat cell viability in a dose- and time-dependent manner, while its inhibitory effect on U937 and K562 cells was weaker. [4]
In vivo	**Methods**: Female Danish Landrace pigs (n=6, weight 37-48 kg) received a single intravenous bolus injection of Acyclovir (10 mg/kg). Monitoring was conducted for 8 hours post-administration, with sampling every 30 minutes. **Results**: Plasma drug concentrations peaked rapidly, but CNS distribution was slow and limited. [1] **Methods**: Four healthy Asian elephant calves received a single intravenous bolus of Acyclovir (15 mg/kg). Blood samples were collected pre-dose and at 0, 0.25, 0.5, 0.75, 1, 1.5, 2, 3, 4, 5, 6, 12, 24, 36, and 48 h post-administration. Plasma drug concentrations were measured by LC-MS/MS. **Results**: At 12 h post-administration, plasma concentrations remained above the IC50 for HSV-1/2 and EHV-1. [2] **Methods**: Male Sprague-Dawley rats received epidural Acyclovir (0.3 mg, 0.6 mg, 0.9 mg) (dissolved in 100 μL) or intravenous Acyclovir (3 mg, 6 mg, 9 mg) (dissolved in 2 mL saline). Blood and cerebrospinal fluid (CSF) samples were collected 1 hour post-administration. **Results**: CSF concentrations in the epidural group were significantly higher than those in the IV group (P<0.05), while plasma concentrations were significantly lower than those in the IV group (P<0.05).[3]
Kinase Assay	Total AMPK activity is measured using the method of Dagher et al. AMPK activity is quantified in the resuspended pellet as incorporation of?32P from [γ-32P]ATP (10

Kinase Assay	GBq/mmol) into a synthetic peptide with the specific target sequence for AMPK, the SAMS peptide. Radioactivity is measured using a liquid scintillation counter. Protein content in the solution containing the resupended (NH4)2SO4 pellet is determined using the Bradford method.

Solubility Information

Solubility	DMSO: 42.92 mg/mL (190.59 mM),Sonication is recommended. Ethanol: < 1 mg/mL (insoluble or slightly soluble), (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 2 mg/mL (8.88 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	4.4405 mL	22.2025 mL	44.405 mL
5 mM	0.8881 mL	4.4405 mL	8.881 mL
10 mM	0.444 mL	2.2202 mL	4.4405 mL
50 mM	0.0888 mL	0.444 mL	0.8881 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Mariager T, et al. Distribution of acyclovir in central nervous system compartments: a porcine pharmacokinetic model. Antimicrob Agents Chemother. 2025 Aug 6;69(8):e0181124.
Wang C, Guan Y, Lv M, et al. Manganese Increases the Sensitivity of the cgas-sting Pathway for Double-stranded Dna and Is Required for the Host Defense against Dna Viruses. Immunity. 2018, 48(4): 675-687. e7
Wang Z, Zou W, Zeng Q, et al.Novel Hsp90α inhibitor inhibits HSV-1 infection by suppressing the Akt/β-catenin pathway.International Journal of Antimicrobial Agents.2025: 107448.
Khammesri S, Ampasavate C, Hongwiset D, Mektrirat R, Sangsrijan S, Brown JL, Thitaram C. Pharmacokinetics and analytical determination of acyclovir in Asian elephant calves (Elephas maximus). Vet Anim Sci. 2021 Dec 24;15: 100227.
Kim JH, Lee MK, Kim JE, Kim SH, Choi SS. Comparison of Intrathecal Concentrations of Acyclovir following Epidural and Intravenous Administration in Rats. Pain Physician. 2016 May;19(4):E613-9.
Benedetti S, et al. Acyclovir induces cell cycle perturbation and apoptosis in Jurkat leukemia cells, and enhances chemotherapeutic drug cytotoxicity. Life Sci. 2018;215:80-85.

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