Adenosine 5'-monophosphate monohydrate

Cat. No.: HY-A0181A

CAS No.: 18422-05-4

Molecular Formula: $C_{10}H_{16}N_5O_8P$

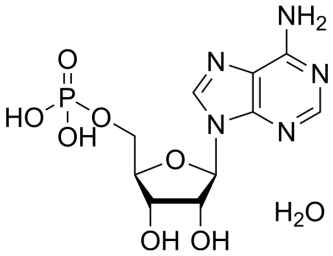
Molecular Weight: 365.24

Target: Adenosine Receptor; HSV; Endogenous Metabolite

Pathway: GPCR/G Protein; Anti-infection; Metabolic Enzyme/Protease

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

H_2O : 5 mg/mL (13.69 mM; Need ultrasonic and warming)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.7379 mL	13.6896 mL	27.3793 mL
	5 mM	0.5476 mL	2.7379 mL	5.4759 mL
	10 mM	0.2738 mL	1.3690 mL	2.7379 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 5.26 mg/mL (14.40 mM); Clear solution; Need ultrasonic and warming and heat to 60°C

BIOLOGICAL ACTIVITY

Description

Adenosine 5'-monophosphate monohydrate is an adenosine A_1 receptor agonist. Adenosine 5'-monophosphate monohydrate has significant antiviral activity against HSV-1 and HSV-2.

IC_{50} & Target	Microbial Metabolite	HSV-1	HSV-2	Human Endogenous Metabolite

In Vitro

Adenosine 5'-monophosphate monohydrate is an adenosine A1 receptor agonist[1]. Adenosine 5'-monophosphate monohydrate (5'-AMP)-induced cell toxicity is negligible at concentrations of 25 to 400 μM in RAW264.7 cells. Adenosine 5'-monophosphate monohydrate significantly attenuates the mRNA expression of tumor necrosis factor-α (TNF-α) and interleukin (IL)-6 in RAW264.7 cells. The dose-dependence of TNF-α and IL-6 mRNA show that at concentration of 400 μM, Adenosine 5'-monophosphate monohydrate exhibits the maximum inhibition. Exposure of cells to Adenosine 5'-monophosphate monohydrate significantly reduces recruitment of NF-κB p65 to TNF-α, IL-6, and IL-1β gene promoters[2].

	MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	C57BL/6J mice treated with Adenosine 5'-monophosphate monohydrate (5′-AMP) markedly increases hepatic adenosine level. Survival rate in PBS-treated mice (n=15) is 60% (8 h) and 33.3% (24 h), whereas survival rate in Adenosine 5'-monophosphate monohydrate-treated mice (n=15) is 100% (8 h) and 93.3% (24 h). Serum aspartate transaminase (AST) and alanine transaminase (ALT) levels are significantly lowered in the Adenosine 5'-monophosphate monohydrate group than in the vehicle group. The area and extent of necrosis is attenuated and the infiltration of inflammatory cells is reduced in the Adenosine 5'-monophosphate monohydrate group[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Kinase Assay [2]	RAW264.7 cells are plated in 100-mm dishes and stimulated with lipopolysaccharide (LPS) for 1 h. Cross-linked chromatin are sonicated into DNA fragment of 0.5 to 1.0 kb. For in vitro biochemical experiments, the sonicated cell lysates are incubated with Adenosine 5'-monophosphate monohydrate (5′-AMP) (400 μM) at 37°C for 30 min. Then chromatin is precleared with 50% salmon sperm DNA-saturated protein A agarose beads and immunoprecipitated with 5 μg of antibody [2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Cell Assay [2]	The RAW264.7 cells (a murine macrophage cell line) are maintained in supplemented RPMI 1640 in an atmosphere at 90% humidity containing 5% CO_2 at 37°C. At the end of the pre-incubated period, cells are rinsed with PBS and the medium is supplemented with RPMI 1640 without fetal bovine serum. The cells are pretreated with Adenosine 5'-monophosphate monohydrate (5′-AMP) (400 μM) for 30 min[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Male WT C57BL/6J mice are used at 8 to 10 weeks of age with a body weight of 20 to 25 g in this work. For Adenosine 5'-monophosphate monohydrate (5′-AMP)-pretreated survival experiment, WT mice are randomly divided into two groups (n=15 in each group). Adenosine 5'-monophosphate monohydrate (5 mg/20 g body weight i.p.) or PBS is administered to mice. For general experiment, WT mice are randomly divided into different groups (n=5 in each group): (1) vehicle/vehicle group; (2) Adenosine 5'-monophosphate monohydrate/vehicle group. Mice are killed and the blood is collected from the carotid artery. The liver of each mouse is removed immediately and then is kept at -80°C until analyzed[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Theranostics. 2020 Aug 13;10(22):10245-10261.
- Stem Cell Res Ther. 2023 Sep 29;14(1):277.
- Molecules. 2023 Apr 11, 28(8), 3375.
- Genes (Basel). 2022 Dec 16;13(12):2384.
- Biochem Biophys Res Commun. 2024 May 14, 708, 149814.

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REFERENCES

[1]. Rittiner JE, et al. AMP is an adenosine A1 receptor agonist. J Biol Chem. 2012 Feb 17;287(8):5301-9.

[2]. Zhan Y, et al. Adenosine 5'-monophosphate ameliorates D-galactosamine/lipopolysaccharide-induced liver injury through an adenosine receptor-independent

mechanism in mice. Cell Death Dis. 2014 Jan 9;5:e985.

[3]. Ayisi NK, et al. Comparison of the antiviral effects of 5-methoxymethyldeoxyuridine-5'-monophosphate with adenine arabinoside-5'-monophosphate. Antiviral Res. 1983 Sep;3(3):161-74.

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