ATP

Cat. No.: HY-B2176

CAS No.: 56-65-5

Molecular Formula: $C_{10}H_{16}N_5O_{13}P_3$

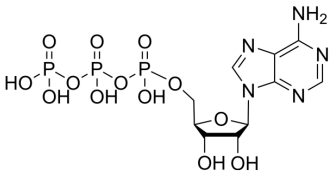
Molecular Weight: 507.18

Target: Endogenous Metabolite

Pathway: Metabolic Enzyme/Protease

Storage: -20°C, sealed storage, away from moisture

* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

H_2O : ≥ 100 mg/mL (197.17 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.9717 mL	9.8584 mL	19.7169 mL
5 mM	0.3943 mL	1.9717 mL	3.9434 mL
10 mM	0.1972 mL	0.9858 mL	1.9717 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (197.17 mM); Clear solution; Need ultrasonic and warming and heat to 60°C

BIOLOGICAL ACTIVITY

Description

ATP (Adenosine 5'-triphosphate) is a central component of energy storage and metabolism in vivo. ATP provides the metabolic energy to drive metabolic pumps and serves as a coenzyme in cells. ATP is an important endogenous signaling molecule in immunity and inflammation[1][2].

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

ATP (5 mM; 1 hour) co-treatment with LPS (1 μg/mL) has a synergistic effect on the activation of the NLRP3 inflammasome in HGFs[3].

ATP (2 mM; 0.5-24 hours) induces secretion of IL-1β, KC and MIP-2 from BMDMs in a caspase-1 activation-dependent manner [4].

ATP promotes neutrophil chemotaxis in vitro[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

ATP (50 mg/kg; i.p.) protects mice against bacterial infection in vivo[4].
ATP induces the secretion of IL-1β, KC and MIP-2 and neutrophils recruitment in vivo[4].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Four-week-old Kunming mice (18-22 g)[4]
Dosage:	50 mg/kg
Administration:	Intraperitoneal injection, before bacterial (E. coli) challenge
Result:	Protected mice from bacterial infection.

CUSTOMER VALIDATION

- Immunity. 2024 Mar 12;57(3):495-512.e11.
- Protein Cell. 2021 Oct 22;1-21.
- ACS Nano. 2023 Nov 21.
- Mol Cell. 2023 May 19;S1097-2765(23)00324-6.
- Mol Cell. 2022 Apr 14:S1097-2765(22)00290-8.

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REFERENCES

[1]. Swennen EL, et al. Immunoregulatory effects of adenosine 5'-triphosphate on cytokine release from stimulated whole blood. Eur J Immunol. 2005 Mar;35(3):852-8.

[2]. M J L Bours, et al. Adenosine 5'-triphosphate and adenosine as endogenous signaling molecules in immunity and inflammation. Pharmacol Ther. 2006 Nov;112(2):358-404.

[3]. Shuo Xu, et al. Doxycycline inhibits NAcht Leucine-rich repeat Protein 3 inflammasome activation and interleukin-1β production induced by Porphyromonas gingivalis-lipopolysaccharide and adenosine triphosphate in human gingival fibroblasts. Arch Oral Biol. 2019 Nov;107:104514.

[4]. Yang Xiang, et al. Adenosine-5'-Triphosphate (ATP) Protects Mice against Bacterial Infection by Activation of the NLRP3 Inflammasome. PLoS One. 2013; 8(5): e63759.

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