Inosine

Cat. No.: HY-N0092

CAS No.: 58-63-9

Molecular Formula: $C_{10}H_{12}N_4O_5$

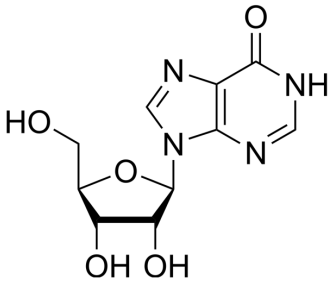
Molecular Weight: 268.23

Target: Endogenous Metabolite; Adenosine Receptor

Pathway: Metabolic Enzyme/Protease; GPCR/G Protein

Storage:

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



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (372.81 mM; Need ultrasonic)

H_2O : 10 mg/mL (37.28 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	3.7281 mL	18.6407 mL	37.2814 mL
	5 mM	0.7456 mL	3.7281 mL	7.4563 mL
	10 mM	0.3728 mL	1.8641 mL	3.7281 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 15.56 mg/mL (58.01 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (9.32 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (9.32 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (9.32 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Inosine is an endogenous purine nucleoside produced by catabolism of adenosine. Inosine has anti-inflammatory, antinociceptive, immunomodulatory and neuroprotective effects. Inosine is an agonist for adenosine A_1 (A_1R) and A_{2A} ($A_{2A}R$) receptors[1][2][3].

IC_{50} & Target	Human Endogenous Metabolite	A_1AR	$A_{2A}R$

In Vitro

Inosine dose-dependently stimulates cAMP production mediated through the $A_{2A}R$[2].
Inosine dose-dependently induces $hA_{2A}R$-mediated ERK1/2 phosphorylation[2].
Inosine (100 μM; 24 hours) reduces oxidative stress in MES 23.5 cells cultured with astrocytes[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Inosine can be used in animal modeling to construct high uric acid models. Inosine (10-100 mg/kg; i.p.) exhibits antinociceptive effect in mice[2].

Induction of Hyperuricemia[5]

Background

> Hyperuricaemia (HUA) occurs because of purine metabolism aberrations and is typically characterized by increased uric acid formation or reduced uric acid excretion. Inosineis a precursor of purine metabolism. Purine nucleoside phosphorylase (PNP) and xanthine oxidase (XO) catalyse the conversion of inosine [6]. Inosinecan further catalyzed hypoxanthine, xanthine and uric acid (UA)[7].

Specific Mmodeling Methods

> Mice: Alb-CreERT2;Glut9lox/lox (LG9KO) &bulll; 6-week-old
> Administration: 4 g/kg • ig • one time daily at 9:00-10:00 A.M. for 3 days

Note

> (1)Mice was gavaged one time daily at 9:00–10:00 A.M. for 3 days (days 0, 1, and 2) with 4 g/kg inosine (500 mg/ml in 0.5% carboxymethylcellulose aqueous suspension) and euthanized 24 h after the last inosine gavage (day 3).(2)Blood was collected from tail bleeds for plasma urate and creatinine measurements before the inosine treatment and 2 h, 6 h after the first gavage, and 24 h after the last gavage before the animals were euthanized.(3)Six weeks after inosine gavage, plasma urate and creatinine had normalized. Inosine gavage combines with HFD to cause acute renal failure in LG9KO mice.

Modeling Record

> Molecular changes: Inosine elevates plasma urate levels in LG9KO mice. In LG9KO mice fed chow, uricemia transiently rose 2 and 6 h after the first gavage and returned to their basal level 24 h after the last gavage (day 3). In contrast, in HFD-fed LG9KO mice, inosine gavage induced a much higher hyperuricemia at day 3
> Tissue changes: leads to tubular urate and uric acid crystal formation.

Correlated Product(s): Potassium oxonate (HY-17511)

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Animal Model:	Male/female C57BL/6 mice[2]
Dosage:	1 mg/kg, 10 mg/kg, 100 mg/kg

Administration:	Intraperitoneal injection, 20 min before formalin treatment
Result:	Reduced flinching behaviour induced by formalin (2 %; 20 μL; intraplantar injection).

CUSTOMER VALIDATION

- Talanta. 2023 Sep 6, 125171.
- Mol Ther Oncolytics. 28 August 2021.
- BMC Neurol. 2023 Dec 16;23(1):444.
- SSRN. 2022.
- Research Square Preprint. 2022 Feb.

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[2]. Tang DH, et al. Inosine induces acute hyperuricaemia in rhesus monkey (Macaca mulatta) as a potential disease animal model. Pharm Biol. 2021 Dec;59(1):175-182.

[3]. Zhao H, et al. Lacticaseibacillus rhamnosus Fmb14 prevents purine induced hyperuricemia and alleviate renal fibrosis through gut-kidney axis. Pharmacol Res. 2022 Aug;182:106350.

[4]. Filipe Marques Gonçalves, et al. Signaling pathways underlying the antidepressant-like effect of inosine in mice. Purinergic Signal. 2017 Jun; 13(2): 203-214.

[5]. Ajith A. Welihinda, et al. The adenosine metabolite inosine is a functional agonist of the adenosine A2A receptor with a unique signaling bias. Cell Signal. 2016 Jun; 28(6): 552-560.

[6]. Francisney Pinto Nascimento, et al. Adenosine A1 receptor-dependent antinociception induced by inosine in mice: pharmacological, genetic and biochemical aspects. Mol Neurobiol. 2015;51(3):1368-78.

[7]. Sara Cipriani, et al. Protection by inosine in a cellular model of Parkinson's disease. Neuroscience. 2014 Aug 22; 274: 242-249.

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