

Product Data Sheet

Product Name: Inosinic acid (IMP)

Cat. No.: GC19718

Chemical Properties

Cas. No. 131-99-7

SMILES O[C@]([C@](O)([H])[C@]1([H])N2C=NC3=C2N=CN=C3O)([H])[C@@](O1)([H])COP(O)(O)=O

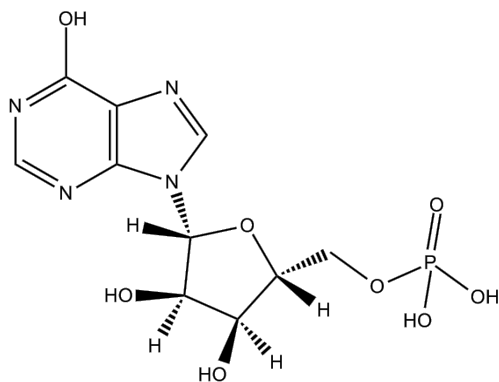
Formula $C_{10}H_{13}N_4O_8P$ M.Wt 348.21

Solubility insoluble in EtOH; >70 mg/mL in Water Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C 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



Protocol

Caution: Product has not been fully validated for medical applications. For research use only.

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Cell experiment [1]:

Cell lines Lineage-/low bone marrow cells (murine hematopoietic progenitor cells)

Preparation Method Lineage-/low cells were isolated from wild-type C57BL/6 mouse bone marrow using a lineage cell depletion kit. Cells were cultured in SFEM medium supplemented with 10ng/mL stem cell factor, 10ng/mL thrombopoietin, and 10ng/mL IL-3 at 37°C, 5% CO₂. Cells were treated with Inosinic acid at concentrations of 0-15mM for 24-72 hours.

Reaction
Conditions 0-15mM; 24-72h.

Applications Inosinic acid treatment significantly stimulated granulocyte-monocyte progenitor (GMP) cell proliferation and Gr-1⁺ granulocyte production in a dose-dependent manner. Inosinic acid enhanced BrdU incorporation into GMP cells by 1.3-fold and increased the proportion of Gr-1⁺ cells by 1.4-fold compared to control cells.

Animal experiment [2]:

Animal models C57BL/6 mice

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Preparation Method	Mice were intraperitoneally administered Inosinic acid (1000mg/kg) 30 minutes prior to LPS (10mg/kg, i.p.) challenge. Plasma and organ samples (spleen, liver, lung) were collected 90 minutes post-LPS for cytokine analysis. For bacterial sepsis models, Inosinic acid (1000mg/kg, i.p.) was administered 1 hour before cecal ligation and puncture (CLP) or intranasal bacterial infection (<i>Streptococcus pneumoniae</i> and <i>Escherichia coli</i>).
Dosage form	1000mg/kg; i.p.
Applications	Inosinic acid significantly suppressed TNF- α production and augmented IL-10 levels in endotoxemic mice.

References:

- [1] Luo XM, Lam SM, Dong Y, et al. The purine metabolite inosine monophosphate accelerates myelopoiesis and acute pancreatitis progression. *Commun Biol.* 2022 Oct 12;5(1):1088.
- [2] Lovász M, Németh ZH, Gause WC, et al. Inosine monophosphate and inosine differentially regulate endotoxemia and bacterial sepsis. *FASEB J.* 2021 Nov;35(11):e21935.

Background

Inosinic acid (IMP) is a nucleotide that plays a central role in purine metabolism and is also an important flavor enhancer in food^[1]. Inosinic acid can be further converted into adenosine monophosphate (AMP) and guanosine monophosphate (GMP), and it participates in the energy metabolism process within cells^[2]. Inosinic acid is commonly used as a food additive (E630), and when used in combination with monosodium glutamate (MSG), Inosinic acid significantly enhances the umami flavor of food and is widely used in feed additives^[3]. Inosinic acid also shows potential research value in immune regulation and neuroprotection^[4].

In vitro, treatment of lineage⁻/low bone marrow cells with Inosinic acid (15mM) for 15–30 minutes activates the pAkt and pS6 signaling pathways, stimulating the upregulation of cKit membrane

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expression and promoting the proliferation of granulocyte-macrophage progenitors (GMP) and the generation of Gr-1⁺ granulocytes^[5].

In vivo, Inosinic acid (45mg/kg) was intraperitoneally injected 15 minutes after X-ray irradiation to treat male Kv:SHK strain mice that had undergone 7Gy total body irradiation. Inosinic acid significantly increased the survival rate after a lethal dose of irradiation, alleviated radiation-induced leukopenia and thrombocytopenia, and reduced the level of DNA damage in bone marrow and thymus cells^[6]. Inosinic acid (1000mg/kg) was intraperitoneally injected into 10- to 12-week-old C57BL/6J mice with sepsis. Inosinic acid significantly inhibited TNF- α production in sepsis and enhanced IL-10 levels^[7].

References:

- [1] Dewulf JP, Marie S, Nassogne MC. Disorders of purine biosynthesis metabolism. Mol Genet Metab. 2022 Jul;136(3):190-198.
- [2] Takahashi H, Tokura M, Kawarasaki S, et al. Metabolomics reveals inosine 5'-monophosphate is increased during mice adipocyte browning. J Biol Chem. 2022 Oct;298(10):102456.
- [3] Zhang GQ, Ma QG, Ji C. Effects of dietary inosinic acid on carcass characteristics, meat quality, and deposition of inosinic acid in broilers. Poult Sci. 2008 Jul;87(7):1364-9.
- [4] Duong-Ly KC, Kuo YM, Johnson MC, et al. T cell activation triggers reversible inosine-5'-monophosphate dehydrogenase assembly. J Cell Sci. 2018 Sep 5;131(17):jcs223289.
- [5] Luo XM, Lam SM, Dong Y, et al. The purine metabolite inosine monophosphate accelerates myelopoiesis and acute pancreatitis progression. Commun Biol. 2022 Oct 12;5(1):1088.
- [6] Asadullina NR, Usacheva AM, Gudkov SV. Protection of mice against X-ray injuries by the post-irradiation administration of inosine-5'-monophosphate. J Radiat Res. 2012;53(2):211-6.
- [7] Lovász M, Németh ZH, Gause WC, et al. Inosine monophosphate and inosine differentially regulate endotoxemia and bacterial sepsis. FASEB J. 2021 Nov;35(11):e21935.

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