Ethyl pyruvate

Cat. No.: HY-Y1362

CAS No.: 617-35-6

Molecular Formula: $C_5H_8O_3$

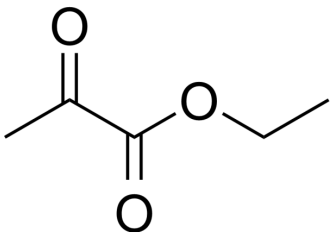
Molecular Weight: 116.12

Target: Autophagy; Apoptosis; Pyroptosis; NF-κB

Pathway: Autophagy; Apoptosis; Immunology/Inflammation; NF-κB

Storage:

Pure form	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

H_2O : 100 mg/mL (861.18 mM; Need ultrasonic)
DMSO : 100 mg/mL (861.18 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	8.6118 mL	43.0589 mL	86.1178 mL
5 mM	1.7224 mL	8.6118 mL	17.2236 mL
10 mM	0.8612 mL	4.3059 mL	8.6118 mL

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

BIOLOGICAL ACTIVITY

Description

Ethyl pyruvate is a simple derivative of the endogenous metabolite pyruvate. Ethyl pyruvate is an HMGB1 release inhibitor. Ethyl pyruvate can induce apoptosis by autophagy. Ethyl pyruvate has anti-inflammatory, antioxidant and anti-tumor activity. Ethyl pyruvate can be used in the study of neurodegenerative diseases such as Alzheimer's and Parkinson's disease [1][2][3][4][5].

In Vitro

Ethyl pyruvate (10 mM, 1 h) has no toxic effect on N9 microglial cells in the range of 1-10 mM. The activation of microglia NLRP3 inflammasome is decreased by inhibiting the HMGB1/ NF-κB /miR-223 signaling pathway[2].
Ethyl pyruvate (10-40 mM, 6, 24 h) induces apoptosis in MC38 cells[3].
Ethyl pyruvate (5-15 mM, 2 h) has an IC_{50} value of 28.83 mM on mouse peritoneal macrophages. Endotoxemia and sepsis are prevented by inhibiting caspase-11-dependent pyroptosis [4].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[2]

Cell Line:	N9 microglial
Concentration:	1-100 mM
Incubation Time:	1 h
Result:	Did not show cytotoxic effects in the range of 1–10 mM.

Western Blot Analysis[2]

Cell Line:	N9 microglial
Concentration:	10 mM
Incubation Time:	1 h
Result:	Suppressed LPS (HY-D1056)- and ATP (HY-B2176)-induced IL-1β and IL-18 protein and mRNA levels. Reduced NLRP3, Caspase-1, and ASC Specks. Reduced NF-κB activation and HMGB1 expression level.

Apoptosis Analysis[3]

Cell Line:	MC38
Concentration:	10, 20, 40 mM
Incubation Time:	6, 24 h
Result:	Induced an increase in autophagy and apoptosis in a dose-and time-dependent manner.

In Vivo

Ethyl pyruvate (80 mg/kg intraperitoneal injection for 9 consecutive days) inhibits tumor growth in a mouse liver tumor model[3].

Ethyl pyruvate (2 or 40 mg/kg, intraperitoneal injection) has reduced lipid peroxidation and anti-inflammatory effects in a rat model of paraquat intoxication[5].

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

Animal Model:	Liver tumor model in mice[3]
Dosage:	80 mg/kg
Administration:	i.p., 30 min before tumor injection and daily up to 9 days and daily from 7 to 10 days after infusion of tumor cells.
Result:	Decreased innate immune cells (NK cells, monocytes) and T and B cell lymphocytic infiltrates. Inhibited the release of HMBG1.

Animal Model:	Paraquat-intoxicated rats[5]
Dosage:	2 or 40 mg/kg
Administration:	30 min before or 1 h after paraquat (50 mg/kg i.p.)
Result:	Decreased the MDA concentrations at 6 and 24 h.

	Decreased NO concentrations significantly at 6 h and GSH concentrations in the lung.

CUSTOMER VALIDATION

- Cell Death Dis. 2019 Sep 26;10(10):724.
- Life Sci. 2021 Jan 5;118987.
- J Pharm Pharmacol. 2023 Mar 25;rgad021.
- PeerJ. August 4, 2022.
- Research Square Preprint. 2021 Jul.

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REFERENCES

[1]. Liang X, et al. Ethyl pyruvate administration inhibits hepatic tumor growth. J Leukoc Biol. 2009 Sep;86(3):599-607.

[2]. Qiu X, et al. Ethyl pyruvate confers protection against endotoxemia and sepsis by inhibiting caspase-11-dependent cell pyroptosis. Int Immunopharmacol. 2020 Jan;78:106016.

[3]. Lee J, et al. Protective effects of ethyl pyruvate treatment on paraquat-intoxicated rats. Hum Exp Toxicol. 2008 Jan;27(1):49-54.

[4]. Fink MP. Ethyl pyruvate: a novel anti-inflammatory agent. J Intern Med. 2007 Apr;261(4):349-62.

[5]. Olcum M, Tufekci KU, Durur DY, et al. Ethyl Pyruvate Attenuates Microglial NLRP3 Inflammasome Activation via Inhibition of HMGB1/NF-κB/miR-223 Signaling. Antioxidants (Basel). 2021;10(5):745.

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