Methionine

Cat. No.: HY-13694

CAS No.: 348-67-4

Molecular Formula: $C_5H_{11}NO_2S$

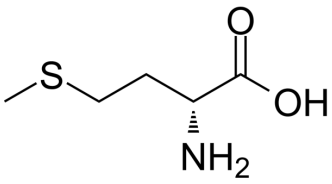
Molecular Weight: 149.21

Target: GABA Receptor; Endogenous Metabolite

Pathway: Membrane Transporter/Ion Channel; Neuronal Signaling; Metabolic Enzyme/Protease

Storage:

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



SOLVENT & SOLUBILITY

In Vitro

H_2O : 25 mg/mL (167.55 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	6.7020 mL	33.5098 mL	67.0196 mL
5 mM	1.3404 mL	6.7020 mL	13.4039 mL
10 mM	0.6702 mL	3.3510 mL	6.7020 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 16.67 mg/mL (111.72 mM); Clear solution; Need ultrasonic and warming and heat to 60°C

BIOLOGICAL ACTIVITY

Description

Methionine (MRX-1024; D-Methionine) is an effective chemoprotective agent which can also inhibit the neuronal activity through $GABA_A$ receptor activation.

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

The incubation of human plasma with Methionine (D-methionine) and CP leads to the formation of a Pt-D-methionine complex independent of the order of addition. In plasma, an early CP hydrolysis product reacts with Methionine to form a 1:1 complex that is followed by the formation of a 2:1 compound at a later time point. The formation of these Pt-D-methionine species plays an important role in the processes by which Methionine protects mammalian organisms against CP-induced toxicities[2].

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

In Vivo	When Methionine (D-methionine) is administered along with cisplatin the cell density is 0.8±0.070 (SEM), significantly larger than in rats treated with only cisplatin (P<0.01) while not significantly different from controls or from animals treated only with D-methionine (P>0.05). When Methionine is administered alone the average cell density is 0.95±0.099 (SEM) and not significantly different from controls (P>0.05)[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	Plasma (2.0 mL) is spiked with 81 mL of the CP stock solution, incubated at 37°C for 30 min and then 20 mL of theMethionine (D-methionine) stock solution (40.7 mg/mL) is added. The obtained mixture is analyzed after 10 min and 50 min of incubation at 37°C[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [3]	Three sham controls receive 0.9% saline instead of cisplatin. Three rats receive only cisplatin. Another three rats receive Methionine (D-methionine) 30 minutes prior to treatment with cisplatin. Injection of Methionine prior to cisplatin treatment ensures that it is already taken up before cisplatin is applied. Finally, three rats are treated only with Methionine. All 12 rats are sacrificed at day 7 post-treatment. For prescreening, two further rats are treated with cisplatin alone and sacrificed 2 or 21 days later. All rats are hydrated with 0.9% saline[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Metab. 2023 Jan 30.

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REFERENCES

[1]. Wu C, et al. Antioxidants L-carnitine and D-methionine modulate neuronal activity through GABAergic inhibition. J Neural Transm (Vienna). 2014 Jul;121(7):683-93.

[2]. Sooriyaarachchi M, et al. Chemoprotection by D-methionine against cisplatin-induced side-effects: insight from in vitrostudies using human plasma. Metallomics. 2014 Mar;6(3):532-41.

[3]. Hinduja S, et al. D-methionine protects against cisplatin-induced neurotoxicity in the hippocampus of the adult rat. Neurotox Res. 2015 Apr;27(3):199-204.

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