3-(Methylthio)propionic acid

Cat. No.: HY-101401

CAS No.: 646-01-5

Molecular Formula: $C_4H_8O_2S$

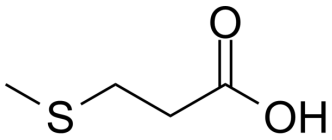
Molecular Weight: 120.17

Target: Fungal; Endogenous Metabolite

Pathway: Anti-infection; Metabolic Enzyme/Protease

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 : 25 mg/mL (208.04 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	8.3215 mL	41.6077 mL	83.2154 mL
	5 mM	1.6643 mL	8.3215 mL	16.6431 mL
	10 mM	0.8322 mL	4.1608 mL	8.3215 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 (832.15 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

3-(Methylthio)propionic acid is an intermediate in the methionine metabolism.

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

Methionine has consistently been shown to be the most toxic amino acid in experiments devised to assess the relative toxicity of dietary amino acids. 3-methylthiopropionate is an intermediate in methionine catabolism in rat and monkey liver in vitro. This pathway appears to account for a major portion of methionine oxidation in vitro[1]. Cultures of Streptomyces lincolnensis accumulated 3-methylthioacrylic acid in amounts directly related to the concentration of methionine in the medium. The first intermediate in the pathway may be the keto acid, which is then oxidatively decarboxylated to 3-methylthiopropionic acid[2]. The purified 3-MTPA has antifungal activity in assays using F. oxysporum as a model fungus. Daily measurements of shoot and root length shows severe inhibition of seed germination and root and shoot development at concentrations above 12mg for partially purified extracts[3]. 3-methylthiopropionic acid ethyl ester possesses potential

anticarcinogenic properties by inducing differentiation in well-differentiated colon cancer cells. Treatment of RCM-1 cells for 4 days with 3-methylthiopropionic acid ethyl ester between the doses of 0.25 and 2 mM progressively increases the percent area occupied by duct structures relative to the control, and also induces an increase in the number and the maximum diameter of the ducts in each culture plate[4].

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

PROTOCOL

Cell Assay [4]

RCM-1 cells are each plated into 35-mm plastic culture plates. Twenty-four hours after plating, cells are treated with 3-methylthiopropionic acid ethyl ester in 2 mL of 10% FBS-RPMI+F12 for 4 days, and are counted by using a hemacytometer, after trypsinization with 0.25% trypsin and 1 mM EDTA[4].

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

REFERENCES

[1]. Steele RD, et al. Identification of 3-methylthiopropionic acid as an intermediate in mammalian methioninemetabolism in vitro. J Biol Chem. 1978 Nov 10;253(21):7844-50.

[2]. Surette R, et al. Formation of 3-methylthioacrylic acid from methionine by Streptomyces lincolnensis. Isolation of a peroxidase. J Antibiot (Tokyo). 1976 Jun;29(6):646-52.

[3]. Kim YC, et al. 3-methylthiopropanoic acid produced by Enterobacter intermedium 60-2G inhibits fungal growth and weed seedling development. J Antibiot (Tokyo). 2003 Feb;56(2):177-80.

[4]. Nakamura Y, et al. 3-Methylthiopropionic acid ethyl ester, isolated from Katsura-uri (Japanese pickling melon, Cucumis melo var. conomon), enhanced differentiation in human colon cancer cells. J Agric Food Chem. 2008 May 14;56(9):2977-84.

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