Data Sheet (Cat.No.T4973)

TargetMol

Paraxanthine

Chemical Properties

CAS No. : 611-59-6

Formula: C7H8N4O2

Molecular Weight: 180.16

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	Paraxanthine (1,7-dimethylxanthine) is a metabolite of caffeine (sc-202514) which functions as an adenosine receptor ligand and a PARP-1 inhibitor in pulmonary epithelial cells. Studies suggest that Paraxanthine is structurally similar to caffeine and possibly mediates the physiological effects of caffeine. Also Paraxanthine acts as a competitive phosphodiesterase inhibitor, which increases intracellular cAMP, activates PKA, inhibits TNF-α and leukotriene synthesis. In addition, Paraxanthine acts as a Na+/K+ ATPase enzymatic effector.
Targets(IC50)	Endogenous Metabolite,Drug Metabolite
In vitro	Upon prolonged exposure to Paraxanthine (PX), there is a dose-dependent increase in the count of TH+ neurons within cultures, with the effect becoming significant at concentrations starting from 100 μM and reaching an optimum between 800 and 1000 μM at 10 days in vitro (DIV). This suggests that Paraxanthine likely contributes to the prevention of dopaminergic (DA) neuron loss. Comparatively, Glial cell line-derived neurotrophic factor (GDNF), a prime growth factor for DA neurons, exhibits only a marginally stronger efficacy than 800 μM of Paraxanthine in DA neuron rescue after 10 and 16 DIV, at its optimal concentration of 20 ng/mL. Notably, Paraxanthine, which is formed through N3-demethylation of approximately 80% of caffeine, is significantly more effective than caffeine in promoting DA neuron survival. For instance, while 800 μM of caffeine results in a modest 40% increase in TH+ neuron count at 10 DIV, an identical concentration of Paraxanthine achieves an optimal enhancement in DA cell survival, indicated by a 169% increase.

Solubility Information

Solubility	H2O: 1 mg/mL (5.55 mM),Sonication is recommended. DMSO: 5.5 mg/mL (30.53 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 1 mg/mL (5.55 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	5.5506 mL	27.7531 mL	55.5062 mL
5 mM	1.1101 mL	5.5506 mL	11.1012 mL
10 mM	0.5551 mL	2.7753 mL	5.5506 mL
50 mM	0.111 mL	0.5551 mL	1.1101 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Jiang M , Kameda K , Han L K , et al. Isolation of lipolytic substances caffeine and 1,7-dimethylxanthine from the stem and rhizome of Sinomenium actum[J]. Planta Medica, 1998, 64(04):375-377.
Marques L J , Zheng L , Poulakis N , et al. Pentoxifylline inhibits TNF-alpha production from human alveolar macrophages.[J]. Am J Respir Crit Care Med, 1999, 159(2):508-511.
Guerreiro S , Toulorge D , Hirsch E , et al. Paraxanthine, the Primary Metabolite of Caffeine, Provides Protection against Dopaminergic Cell Death via Stimulation of Ryanodine Receptor Channels[J]. Molecular Pharmacology, 2008, 74(4):980-1989.
Geraets L , Haegens A , Weseler A R , et al. Inhibition of acute pulmonary and systemic inflammation by 1,7-dimethylxanthine[J]. European Journal of Pharmacology, 2010, 629(1-3):132-139.