Data Sheet (Cat.No.T0492)

TargetMol

Dimethyl fumarate

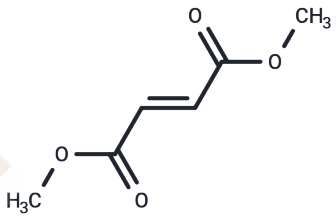
Chemical Properties

CAS No. : 624-49-7

Formula: C6H8O4

Molecular Weight: 144.13

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	Dimethyl fumarate (DMF) is an Nrf2 activator with oral activity and blood-brain barrier permeability. Dimethyl fumarate has antimicrobial, anti-inflammatory, and immunomodulatory activities and has been used in the study of multiple sclerosis.
Targets(IC50)	Reactive Oxygen Species,HIV Protease,Nrf2,Endogenous Metabolite,Autophagy,ROS
In vitro	**METHODS**: Primary cortical cultures or hippocampal HT22 cells were treated with Dimethyl fumarate (10 μM) and glutamate for 24 h. Cell viability was measured by Cell Titer Blue (CTB) assay. **RESULTS**: Pre-incubation with 10 μM MMF Dimethyl fumarate for 24 h protected primary cortex cultures and hippocampal HT22 cells from oxidized glutamate toxicity. [1] **METHODS**: Tumor cells CT26 were treated with Dimethyl fumarate (100 μM) for 3-24 h. LDH release was detected by LDH cytotoxicity assay kit. **RESULTS**: Dimethyl fumarate time-dependently increased LDH release, which reflected necrotic cell death. [2]
In vivo	**METHODS**: To study the effects on Friedreich's ataxia (FA), Dimethyl fumarate (110 mg/kg) was administered orally to a FXNKD mouse model of FA once daily for 18 weeks. **RESULTS**: Dimethyl fumarate rescued these enzyme activities in the brain of the FXNKD mouse model and rescued frataxin and cytochrome oxidase expression in the brain, cerebellum, and quadriceps muscle. [3]

Solubility Information

Solubility	DMSO: 40 mg/mL (277.53 mM),Sonication is recommended. Ethanol: 7.2 mg/mL (49.95 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+90% Saline: 1.5 mg/mL (10.41 mM),Solution. 5% DMSO+95% Saline: 0.29 mg/mL (2.01 mM),Solution. *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	6.9382 mL	34.6909 mL	69.3818 mL
5 mM	1.3876 mL	6.9382 mL	13.8764 mL
10 mM	0.6938 mL	3.4691 mL	6.9382 mL
50 mM	0.1388 mL	0.6938 mL	1.3876 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

Albrecht P, et al. Effects of dimethyl fumarate on neuroprotection and immunomodulation. J Neuroinflammation. 2012 Jul 7;9:163.
Wang Y, Ma H, Huang J, et al. Discovery of bardoxolone derivatives as novel orally active necroptosis inhibitors. European Journal of Medicinal Chemistry,. 2021 Feb 15;212:113030
Dai Y, Li H, Fan S, et al.Dimethyl fumarate promotes the degradation of HNF1B and suppresses the progression of clear cell renal cell carcinoma.Cell Death & Disease.2025, 16(1): 1-12.
Xie X, et al. Dimethyl fumarate induces necroptosis in colon cancer cells through GSH depletion/ROS increase/MAPKs activation pathway. Br J Pharmacol. 2015 Aug;172(15):3929-43.
Hui CK, et al. Dimethyl fumarate dose-dependently increases mitochondrial gene expression and function in muscle and brain of Friedreich's ataxia model mice. Hum Mol Genet. 2021 Feb 25;29(24):3954-3965.
Cross SA, et al. J Immunol,2011, 187(10), 52015-5025.
Jing X, et al. Neuroscience,2015, 286, 131-140.
Li Y, et al. Dimethyl fumarate accelerates wound healing under diabetic condition. J Mol Endocrinol. 2018 Jul 23. pii: JME-18-0102.
Wang Y, Ma H, Huang J, et al. Discovery of bardoxolone derivatives as novel orally active necroptosis inhibitors[J]. European Journal of Medicinal Chemistry. 2020: 113030.