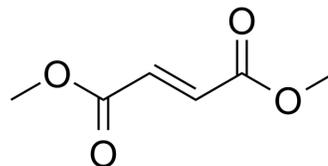


Dimethyl fumarate

Cat. No.:	HY-17363												
CAS No.:	624-49-7												
Molecular Formula:	C ₆ H ₈ O ₄												
Molecular Weight:	144.13												
Target:	Keap1-Nrf2; Endogenous Metabolite; Reactive Oxygen Species; HIV; Autophagy												
Pathway:	NF-κB; Metabolic Enzyme/Protease; Immunology/Inflammation; Anti-infection; Autophagy												
Storage:	<table border="0"> <tr> <td>Powder</td> <td>-20°C</td> <td>3 years</td> </tr> <tr> <td></td> <td>4°C</td> <td>2 years</td> </tr> <tr> <td>In solvent</td> <td>-80°C</td> <td>1 year</td> </tr> <tr> <td></td> <td>-20°C</td> <td>6 months</td> </tr> </table>	Powder	-20°C	3 years		4°C	2 years	In solvent	-80°C	1 year		-20°C	6 months
Powder	-20°C	3 years											
	4°C	2 years											
In solvent	-80°C	1 year											
	-20°C	6 months											



SOLVENT & SOLUBILITY

In Vitro

DMSO : 41.67 mg/mL (289.11 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	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

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

In Vivo

- Add each solvent one by one: 50% PEG300 >> 50% saline
Solubility: 7.5 mg/mL (52.04 mM); Suspended solution; Need ultrasonic
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.08 mg/mL (14.43 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
Solubility: ≥ 2.08 mg/mL (14.43 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: ≥ 2.08 mg/mL (14.43 mM); Clear solution
- Add each solvent one by one: PBS
Solubility: 2 mg/mL (13.88 mM); Clear solution; Need ultrasonic and warming and heat to 60°C

BIOLOGICAL ACTIVITY

Description

Dimethyl fumarate (DMF) is an orally active and brain-penetrant Nrf2 activator and induces upregulation of antioxidant gene expression. Dimethyl fumarate induces necroptosis in colon cancer cells through GSH depletion/ROS increase/MAPKs

activation pathway, and also induces cell autophagy. Dimethyl fumarate can be used for multiple sclerosis research^{[1][2]}.

In Vitro

Dimethyl fumarate (DMF; 20-200 μ M; 24 hours) treatment dose-dependently reduces the viability of SGC-7901, HT29, HCT116 and CT26 cancer cells^[1].

Dimethyl fumarate (DMF; 100 μ M; 3-24 hours) significantly activates JNK, p38 and ERK in CT26 cells^[1].

Dimethyl fumarate induces necroptosis in colon cancer cells and the mechanism involves GSH depletion, an increase in ROS and activation of MAPKs-mediated signalling^[1].

Dimethyl fumarate inhibits dendritic cell (DC) maturation by reducing inflammatory cytokine production (IL-12 and IL-6) and the expression of MHC class II, CD80, and CD86. Dimethyl fumarate impairs NF- κ B signaling via reduced p65 nuclear translocation and phosphorylation. Dimethyl fumarate inhibits maturation of DCs and subsequently Th1 and Th17 cell differentiation by suppression of both NF- κ B and ERK1/2-MSK1 signaling^[2].

Dimethyl fumarate (DMF), an immune modulator and inducer of the antioxidant response, suppresses HIV replication and neurotoxin release^[3].

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

Cell Viability Assay^[1]

Cell Line:	SGC-7901, HT29, HCT116 and CT26 cells
Concentration:	20 μ M, 50 μ M, 100 μ M, 200 μ M
Incubation Time:	24 hours
Result:	Reduced cell viability in SGC-7901, HT29, HCT116 and CT26 cancer cells.

Western Blot Analysis^[1]

Cell Line:	CT26 cancer cells
Concentration:	100 μ M
Incubation Time:	3 hours, 6 hours, 12 hours, 24 hours
Result:	Significantly activated JNK, p38 and ERK in CT26 cells after treatment from 3 to 24 h.

In Vivo

Dimethyl fumarate (DMF; 50 mg/kg; oral gavage; daily; for 7 days) treatment is shown to upregulate the mRNA and protein levels of Nrf2 and Nrf2-regulated cytoprotective genes, attenuate 6-OHDA induced striatal oxidative stress and inflammation in C57BL/6 mice^[4].

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

Animal Model:	Male C57BL/6 mice (8-week-old) ^[4]
Dosage:	50 mg/kg
Administration:	Oral gavage; daily; for 7 days
Result:	Was shown to upregulate mRNA and protein levels of Nrf2 and Nrf2-regulated cytoprotective genes.

CUSTOMER VALIDATION

- Nature. 2023 Mar;615(7952):490-498.
- Redox Biol. 2023 Oct 18, 102938.

- Pharmacol Res. 2023 Feb 14;106697.
- Cell Death Dis. 2024 Mar 18;15(3):224.
- Cell Death Dis. 2020 Jun 15;11(6):459.

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REFERENCES

- [1]. Peng H, et al. Dimethyl fumarate inhibits dendritic cell maturation via nuclear factor κ B (NF- κ B) and extracellular signal-regulated kinase 1 and 2 (ERK1/2) and mitogen stress-activated kinase 1 (MSK1) signaling. *J Biol Chem*. 2012 Aug 10;287(33):28017-26.
- [2]. Cross SA, et al. Dimethyl fumarate, an immune modulator and inducer of the antioxidant response, suppresses HIV replication and macrophage-mediated neurotoxicity: a novel candidate for HIV neuroprotection. *J Immunol*. 2011 Nov 15;187(10):5015-25.
- [3]. Jing X, et al. Dimethyl fumarate attenuates 6-OHDA-induced neurotoxicity in SH-SY5Y cells and in animal model of Parkinson's disease by enhancing Nrf2 activity. *Neuroscience*. 2015 Feb 12;286:131-40
- [4]. Xin Xie, 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.
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Caution: Product has not been fully validated for medical applications. For research use only.

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