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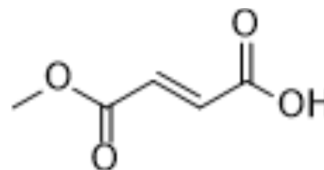
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Monomethyl fumarate

Cat. No.:	HY-103252
CAS No.:	2756-87-8
Molecular Formula:	C ₅ H ₆ O ₄
Molecular Weight:	130.1
Target:	GPR109A; Drug Metabolite
Pathway:	GPCR/G Protein; 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

DMSO : 50 mg/mL (384.32 mM; Need ultrasonic)
H₂O : 10 mg/mL (76.86 mM; ultrasonic and warming and heat to 60°C)

	Solvent Concentration	Mass	1 mg	5 mg	10 mg
Preparing Stock Solutions	1 mM		7.6864 mL	38.4320 mL	76.8639 mL
	5 mM		1.5373 mL	7.6864 mL	15.3728 mL
	10 mM		0.7686 mL	3.8432 mL	7.6864 mL

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

In Vivo

- Add each solvent one by one: PBS
Solubility: 8.33 mg/mL (64.03 mM); Clear solution; Need ultrasonic and warming and heat to 60°C
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: 2.5 mg/mL (19.22 mM); Clear solution; Need ultrasonic
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
Solubility: 2.5 mg/mL (19.22 mM); Clear solution; Need ultrasonic
- Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: 2.5 mg/mL (19.22 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Monomethyl fumarate, an active metabolite of Dimethyl fumarate (DMF), is a potent GPR109A agonist. Monomethyl fumarate has the potential for multiple neuroprotective pathways and other models of retinal disease^{[1][2][3]}.

In Vitro

Monomethyl fumarate completely inhibits forskolin induced cAMP synthesis with an IC₅₀ of 70 nM. Monomethyl fumarate

induces a dose-dependent Ca^{2+} signal in GPR109A transfected cells with an EC_{50} of $9.4 \mu\text{M}$ ^[1].
Monomethyl fumarate ($25 \mu\text{M}$; 24 hours) attenuates 7β -OHC-induced cytotoxicity: cell growth inhibition; decreased cell viability; mitochondrial dysfunction; and cell death induction^[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

A single dose of Monomethyl fumarate (50-100 mg/kg; IP) before light exposure prevents these morphologic changes (bright light exposure induced photoreceptor death) in a dose-dependent manner^[2].
Monomethyl fumarate (100 mg/kg) reduces retinal inflammation and oxidative stress. Monomethyl fumarate significantly suppresses light-induced retinopathy (LIR) upregulated genes in the NFkB pathway including: Nlrp3, Casp1, Il-1 β , and Tnf- α [2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Albino BALB/c mice (male, 6 weeks old) ^[2]
Dosage:	50, 65, 75, 100 mg/kg
Administration:	IP
Result:	Prevented these morphologic changes (bright light exposure induced photoreceptor death) in a dose-dependent manner.

CUSTOMER VALIDATION

- Nature. 2023 Mar;615(7952):490-498.
- Mol Cell. 2023 Aug 11;S1097-2765(23)00605-6.
- Pharmacol Res. 2023 Feb 14;106697.

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REFERENCES

- [1]. Tang H, et al. The psoriasis drug monomethylfumarate is a potent nicotinic acid receptor agonist. Biochem Biophys Res Commun. 2008 Oct 31;375(4):562-5.
- [2]. Jiang D, et al. Monomethyl Fumarate Protects the Retina From Light-Induced Retinopathy. Invest Ophthalmol Vis Sci. 2019 Mar 1;60(4):1275-1285.
- [3]. Sghaier R, et al. Dimethyl fumarate and monomethyl fumarate attenuate oxidative stress and mitochondrial alterations leading to oxiaoptophagy in 158N murine oligodendrocytes treated with 7β -hydroxycholesterol. J Steroid Biochem Mol Biol. 2019 Nov;194:105432.

Caution: Product has not been fully validated for medical applications. For research use only.

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