

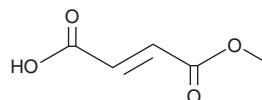
PRODUCT INFORMATION



Monomethyl fumarate

Item No. 27813

CAS Registry No.: 2756-87-8
Formal Name: 2E-butenedioic acid, 1-methyl ester
Synonym: Fumaric Acid monomethyl ester
MF: C₅H₆O₄
FW: 130.1
Purity: ≥98%
Supplied as: A solid
Storage: -20°C
Stability: ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Monomethyl fumarate is supplied as a crystalline solid. A stock solution may be made by dissolving the monomethyl fumarate in the solvent of choice, which should be purged with an inert gas. Monomethyl fumarate is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of monomethyl fumarate in ethanol is approximately 0.5 mg/ml and approximately 10 mg/ml in DMSO and DMF.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of monomethyl fumarate can be prepared by directly dissolving the solid in aqueous buffers. The solubility of monomethyl fumarate in PBS, pH 7.2, is approximately 1 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

Monomethyl fumarate is an active metabolite of the immune modulator dimethyl fumarate (Item No. 14714) that is rapidly formed from dimethyl fumarate by hydrolysis.¹ It is an agonist of the hydroxycarboxylic acid 2 (HCA₂) receptor/GPR109A with an EC₅₀ value of 9.4 μM for inducing calcium accumulation in CHO cells expressing the receptor.² Monomethyl fumarate reduces neutrophil adhesion to endothelial cells stimulated with TNF, decreases CXCL2-directed neutrophil migration, and increases the expression of the Nrf2 target gene *NQO1* in wild-type but not *HCA₂*^{-/-} macrophages.³ It inhibits proliferation and induces differentiation in keratinocytes, as well as decreases the levels of TNF-α induced by phorbol 12-myristate 13-acetate (TPA; Item No. 10008014) in keratinocytes when used at a concentration of 1 mM.⁴ Monomethyl fumarate (1 mg/day) reduces symptoms of experimental autoimmune encephalomyelitis (EAE) in mice and isolated natural killer cells from these mice induced cytotoxicity in previously isolated immature and mature dendritic cells.⁵ Formulations containing monomethyl fumarate have been used in the treatment of multiple sclerosis.

References

1. Dibbert, S., Clement, B., Skak-Nielsen, T., et al. *Arch. Dermatol. Res.* **305**(5), 447-451 (2013).
2. Tang, H., Lu, J.Y.-L., Zheng, X., et al. *Biochem. Biophys. Res. Commun.* **375**(4), 562-565 (2008).
3. Chen, H., Assmann, J.C., Krenz, A., et al. *J. Clin. Invest.* **124**(5), 2188-2192 (2014).
4. Helwa, I., Patel, R., Karempeles, P., et al. *J. Pharmacol. Exp. Ther.* **352**(1), 90-97 (2015).
5. Al-Jaderi, Z. and Maghazachi, A.A. *Toxins (Basel)* **7**(11), 4730-4744 (2015).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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