Mifamurtide

Cat. No.: HY-13682

CAS No.: 83461-56-7

Molecular Formula: $C_{59}H_{109}N_6O_{19}P$

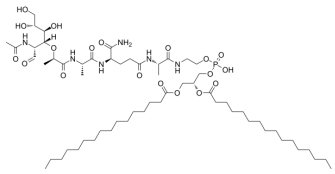
Molecular Weight: 1237.5

Target: NOD-like Receptor (NLR)

Pathway: Immunology/Inflammation

Storage: -20°C, stored under nitrogen

* In solvent : -80°C, 6 months; -20°C, 1 month (stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (80.81 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	0.8081 mL	4.0404 mL	8.0808 mL
	5 mM	0.1616 mL	0.8081 mL	1.6162 mL
	10 mM	0.0808 mL	0.4040 mL	0.8081 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (2.02 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2.5 mg/mL (2.02 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (2.02 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Mifamurtide (MTP-PE), an analog of the muramyl dipeptide (MDP), is a nonspecific immunomodulator by stimulating the immune response activating macrophages and monocytes. Mifamurtide is a specific ligand for NOD2 and acts as an insulin sensitizer. Mifamurtide has potential for use in rare disease and osteosarcoma research[1][2][3].

IC_{50} & Target

NOD2

In Vitro

Mifamurtide (MTP-PE; 100 μM) induces a reduction of MG63 cells number when co-cultured with macrophages[3].
Mifamurtide (100 μM) increases both the M1 polarization marker iNOS and the M2 polarization marker CD206 mRNAs; both pro-inflammatory (IL-1β, IL-6) and anti-inflammatory (IL-4, IL-10) cytokines. Mifamurtide increases the iron transporter

DMT1 protein[3].
L-mifamurtide (5, 5000 nM; for 48 hours) alone has no direct effect on the proliferation rate of the two osteosarcoma cell lines MOS-J and KHOS in vitro or in vivo[1].
Mifamurtide acts as a nonspecific immunomodulator by activating macrophages and monocytes related to the upregulation of tumoricidal activity and secretion of pro-inflammatory cytokines including tumor necrosis factor (TNF)-a, interleukin (IL)-1, IL-6, IL-8, IL-12, nitric oxide (NO), prostaglandin E2 (PGE2) and PGD2[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Mifamurtide (MTP-PE; 1 mg/kg; i.v.; twice per week for 4 weeks) causes a trend of diminished spontaneous lung metastasis dissemination[1].
Mifamurtide (50 μg/mouse) improves glucose tolerance during endotoxemia in mice. Mifamurtide (equivalent to 20 μg MDP; 4 times per week for 5 weeks) improves glucose tolerance in HFD-fed mice without altering body mass[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	C57BL/6, BALB/c mice with KHOS osteosarcoma cells[1]
Dosage:	1 mg/kg
Administration:	IV; twice per week for 4 weeks
Result:	Caused a trend of diminished spontaneous lung metastasis dissemination in xenogeneic (KHOS) and syngeneic (MOS-J) models.

CUSTOMER VALIDATION

- The Ohio State University. 2023 Apr.

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REFERENCES

[1]. Kevin Biteau, et al. L-MTP-PE and zoledronic acid combination in osteosarcoma: preclinical evidence of positive therapeutic combination for clinical transfer. Am J Cancer Res. 2016 Feb 15;6(3):677-89.

[2]. Mifamurtide: CGP 19835, CGP 19835A, L-MTP-PE, liposomal MTP-PE, MLV 19835A, MTP-PE, muramyltripeptide phosphatidylethanolamine. Drugs R D, 2008. 9(2): p. 131-5.

[3]. Joseph F Cavallari, et al. Muramyl Dipeptide-Based Postbiotics Mitigate Obesity-Induced Insulin Resistance via IRF4. Cell Metab. 2017 May 2;25(5):1063-1074.e3.

[4]. Francesca Punzo, et al. Mifamurtide and TAM-like macrophages: effect on proliferation, migration and differentiation of osteosarcoma cells. Oncotarget. 2020 Feb 18;11(7):687-698.

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