Mycophenolic acid

Cat. No.: HY-B0421

CAS No.: 24280-93-1

Molecular Formula: $C_{17}H_{20}O_6$

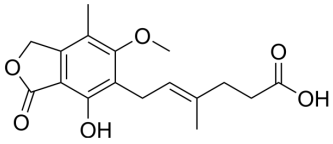
Molecular Weight: 320.34

Target: Apoptosis; Endogenous Metabolite; Bacterial; Fungal; Antibiotic; Flavivirus; Dengue virus

Pathway: Apoptosis; Metabolic Enzyme/Protease; Anti-infection

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 100 mg/mL (312.17 mM)

H_2O : < 0.1 mg/mL (ultrasonic) (insoluble)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.1217 mL	15.6084 mL	31.2168 mL
5 mM	0.6243 mL	3.1217 mL	6.2434 mL
10 mM	0.3122 mL	1.5608 mL	3.1217 mL

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

In Vivo

1. Add each solvent one by one: corn oil
   Solubility: 33.33 mg/mL (104.05 mM); Suspended solution; Need ultrasonic and warming and heat to 60°C
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (7.80 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (7.80 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (7.80 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Mycophenolic acid is a potent uncompetitive inosine monophosphate dehydrogenase (IMPDH) inhibitor with an EC_{50} of 0.24 μM. Mycophenolic acid demonstrates antiviral effects against a wide range of RNA viruses including influenza. Mycophenolic

	acid is an immunosuppressive agent. Antiangiogenic and antitumor effects[1][2].

IC_{50} & Target	Microbial Metabolite	Human Endogenous Metabolite

In Vitro

Mycophenolic acid demonstrates antiviral effects against a wide range of RNA viruses including influenza, dengue virus, Zika virus, rotavirus, CCHFV, and hantavirus[1].

IMPDH is the rate-limiting enzyme in the de novo synthesis of guanosine nucleotides[2].

Mycophenolic acid (0.01-1 μM; 72 hours) exhibits preferential antiproliferative activity against the endothelial cells and fibroblasts. Endothelial cells are most sensitive cells to Mycophenolic acid treatment with an IC_{50} <500 nM for antimitotic effects[2].

Fibroblasts are also prone to Mycophenolic acid-induced cell cycle inhibition but exhibit a higher IC_{50} (<1 μM) compared with endothelial cells. The two human tumor cell lines A549 non-small cell lung cancer cells and PC3 prostate cancer cells show intermediate sensitivity with an IC_{50} >1 μM. U87 glioblastoma cells are resistant against MPA treatment up to 1 μM[2].

Mycophenolic acid (0.05-2 μM; 18 hours) exhibits a dose-dependent down-regulation of HDAC2 and MYC, whereas up-regulates NDRG1[2].

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

Cell Proliferation Assay[2]

Cell Line:	Primary isolated human dermal microvascular endothelial cells (HDMVEC) , fibroblasts, U87 glioblastoma cells, PC3 prostate cancer cells, A549 non-small cell lung cancer cells
Concentration:	0.01, 0.1, 1 μM
Incubation Time:	72 hours
Result:	Exhibited preferential antiproliferative activity against HDMVEC and fibroblasts. Whereas U87 glioblastoma cells were resistant to treatment, A549 non-small cell lung cancer and PC3 prostate cancer cells showed intermediate sensitivity.

Western Blot Analysis[2]

Cell Line:	HDMVEC
Concentration:	0, 0.05, 0.1, 0.5, 1, and 2 μM
Incubation Time:	18 hours
Result:	Showed a dose-dependent regulation of HDAC2, MYC, and NDRG1.

In Vivo

Mycophenolic acid exerts its antitumor effects via modulation of the tumor microenvironment, U87 tumor growth is markedly inhibited in vivo in BALB/c nude mice[2].

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

Animal Model:	Athymic 8-week-old, 20 g BALB/c nu/nu mice bearing Mycophenolic acid-resistant human U87 tumor model[2]
Dosage:	120 mg/kg MMF (the morpholinoethyl ester prodrug of Mycophenolic acid)
Administration:	Oral gavage; b.i.d.
Result:	MMF (the morpholinoethyl ester prodrug of Mycophenolic acid) significantly inhibited tumor growth (⊠70% after day 14 after tumor implantation) in MMF-treated versus control mice. Microvessel density (CD31 staining) and pericyte coverage determined by α-smooth muscle actin staining were markedly reduced in MMF-treated versus control tumors (44%

	and 78%, respectively).

CUSTOMER VALIDATION

- Nat Immunol. 2024 Mar 18.
- J Transl Med. 2024 Feb 3;22(1):133.
- J Agric Food Chem. 2023 Dec 28.
- Viruses. 2021 Jun 28;13(7):1255.
- Bone. 2022 Dec 21;168:116648.

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REFERENCES

[1]. Stephen R Welch, et al. Screening and Identification of Lujo Virus Inhibitors Using a Recombinant Reporter Virus Platform. Viruses. 2021 Jun 28;13(7):1255.

[2]. Sophie Domhan, et al. Molecular mechanisms of the antiangiogenic and antitumor effects of mycophenolic acid. Mol Cancer Ther. 2008 Jun;7(6):1656-68.

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