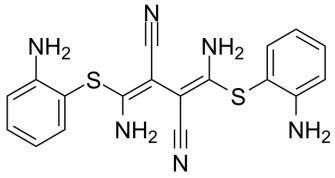
U0126

Cat. No.:	HY-12031A
CAS No.:	109511-58-2
Molecular Formula:	$C_{18}H_{16}N_6S_2$
Molecular Weight:	380.49
Target:	MEK; Autophagy; Mitophagy; Influenza Virus
Pathway:	MAPK/ERK Pathway; Autophagy; Anti-infection
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 : 100 mg/mL (262.82 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.6282 mL	13.1409 mL	26.2819 mL
	5 mM	0.5256 mL	2.6282 mL	5.2564 mL
	10 mM	0.2628 mL	1.3141 mL	2.6282 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 (6.57 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (6.57 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (6.57 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

U0126 is a potent, non-ATP competitive and selective MEK1 and MEK2 inhibitor, with IC_{50}s of 72 nM and 58 nM, respectively. U0126 is an autophagy and mitophagy inhibitor[1][2][3][4].

IC_{50} & Target

MEK2	MEK1
60 nM (IC_{50})	70 nM (IC_{50})

In Vitro

Treatment with U0126 efficiently reduces progeny virus titers of all tested strains in A549 cells. While nM concentrations of

U0126 are efficient to reduce H1N1v and H5N1 (MB1), μM concentrations of U0126 are required to reduce the virus titer of H5N1 (GSB) and H7N7. The EC_{50} values for U0126-EtOH against H1N1v are 1.2±0.4 μM in A549 cells and 74.7±1.0 μM in MDCKII cells[2].

Rat hepatocarcinoma cells (FAO) stimulated by fetal calf serum (FCS) exhibits a significant proportion in S phase (32.62%) whereas U0126 strongly decreases the proportion of cells in S phase (9.92%) and increases the proportion of cells in G_0-G_1 phase and to a lesser extent in G_2/M[3].

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

Cell Viability Assay[2]

Cell Line:	A549 and MDCK II cells.
Concentration:	0.001-1000 μM.
Incubation Time:	48 h.
Result:	The EC_{50} values for U0126 against H1N1v were 1.2 ± 0.4 μM in A549 cells and 74.7 ± 1.0 μM in MDCKII cells

In Vivo

Mice are treated daily with U0126-EtOH (U0126; i.p., 10.5 mg/kg). In control experiment, tumor sizes are constant or slightly increase all over the kinetic. At the opposite, in all U0126-EtOH experiments, engraftment and early tumor growth are significantly decreased. Furthermore, a 60-70% reduction in the volume of tumors treated with U0126-EtOH is obtained 9 days after injection and thereafter[3].

Rats are subjected to 120 minutes transient middle cerebral artery occlusion (tMCAO) and thereafter treated with the U0126-EtOH (U0126; i.p., 30 mg/kg) at 0 and 24 hours of reperfusion. After treatment with U0126-EtOH, the vasoconstriction to S6c is markedly reduced[4].

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

Animal Model:	Athymic female nude mice (SWISS, nu/nu)[3].
Dosage:	10.5 mg/kg.
Administration:	Intraperitoneal injection daily.
Result:	Inhibited tumor growth.

Animal Model:	Twelve-week-old female Wistar rats (250 to 265 g) [4].
Dosage:	30 mg/kg.
Administration:	Intraperitoneally.
Result:	The vasoconstriction to S6c is markedly reduced.

CUSTOMER VALIDATION

- Science. 2022 Jul 8;377(6602):eabg9302.
- Nat Methods. 2023 Nov 2.
- Cell Res. 2018 Dec;28(12):1171-1185.
- Signal Transduct Target Ther. 2020 Aug 26;5(1):153.
- Immunity. 2021 Sep 14;54(9):2042-2056.e8.

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REFERENCES

[1]. Favata MF, et al. Identification of a novel inhibitor of mitogen-activated protein kinase kinase. J Biol Chem. 1998 Jul 17;273(29):18623-32.

[2]. Droebner K, et al. Antiviral activity of the MEK-inhibitor U0126 against pandemic H1N1v and highly pathogenic avian influenza virus in vitro and in vivo. Antiviral Res. 2011, 92(2), 195-203.

[3]. Bessard A, et al. RNAi-mediated ERK2 knockdown inhibits growth of tumor cells in vitro and in vivo. Oncogene. 2008 Sep 11;27(40):5315-25.

[4]. Ahnstedt H, et al. U0126 attenuates cerebral vasoconstriction and improves long-term neurologic outcome after stroke in female rats. J Cereb Blood Flow Metab. 2015 Mar;35(3):454-60.

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

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