Efavirenz

Cat. No.: HY-10572

CAS No.: 154598-52-4

Molecular Formula: $C_{14}H_9ClF_3NO_2$

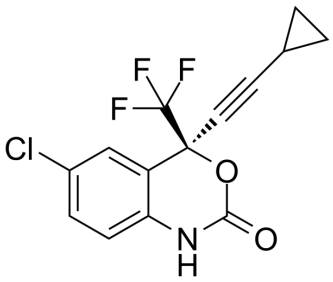
Molecular Weight: 315.68

Target: Reverse Transcriptase; HIV; Autophagy; Endogenous Metabolite; Parasite

Pathway: Anti-infection; Autophagy; 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 : ≥ 38 mg/mL (120.38 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.1678 mL	15.8388 mL	31.6776 mL
5 mM	0.6336 mL	3.1678 mL	6.3355 mL
10 mM	0.3168 mL	1.5839 mL	3.1678 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: ≥ 2.08 mg/mL (6.59 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (6.59 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (6.59 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Efavirenz (DMP 266) is a potent inhibitor of the wild-type HIV-1 reverse transcriptase with a K_i of 2.93 nM and exhibits an IC_{95} of 1.5 nM for the inhibition of HIV-1 replicative spread in cell culture[1].

IC_{50} & Target

HIV-1

In Vitro

Efavirenz (L-743726) is found to be capable of inhibiting, with 95% inhibitory concentrations of ≤ 1.5μM, a panel of

	nonnucleoside reverse transcriptase (RT) inhibitors (NNRTIs)-resistant mutant viruses, each of which expresses a single RT amino acid substitution. Efavirenz is also tested for its activity against a variety of polymerase enzymes and is found to be inactive (IC_{50}>300μM). Efavirenz effectively inhibits several wild-type T-lymphoid cell line-adapted variants. Identical activity (IC_{95}, 1.5 to 3.0 nM) is seen with wild-type primary isolates of the virus in both primary lymphoid and monocytoid cell cultures. Efavirenz also effectively inhibits HIV-1 variants that expressed RT amino acid substitutions which confer the loss of susceptibility to other NNRTIs. For purposes of comparison[1]. Efavirenz is a non-nucleoside analog reverse transcriptase inhibitor (NNRTI) with IC_{50} of 60 nM[2]. Efavirenz inhibits synthesis using an RNA PPT-primed substrate with an IC_{50} of 17 nM [3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	After i.v. administration, Efavirenz (L-743726) is cleared rapidly from rats, but it is cleared considerably more slowly from monkeys. The large volume of distribution (two to four times the amount of body water) in both species indicates extensive tissue binding. The oral bioavailability in rats is 16%. In monkeys, the half-life of Efavirenz after administration of a 1 mg/kg i.v. dose exceeded 2.5 h. Efavirenz is well absorbed orally. Administration to monkeys of oral doses as fine suspensions in 0.5% aqueous methylcellulose yields consistently high levels in plasma. A 2.0 mg/kg dose produces peak levels of 0.5μM at approximately 3.0 h. The absolute bioavailability is estimated to be 42%. A 10 mg/kg dose yields a peak level in plasma of 3.22 μM. A 10 mg/kg oral dose given to a single chimpanzee gave concentrations in plasma of 4.12, 2.95, and 2.69 μM at 2, 8, and 24 h after dosing, respectively[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [1]	Mice[1] Studies are performed in rats, rhesus monkeys, and a single chimpanzee. For analyses of the drug given to rats intravenously (i.v.), a group (n=4 or 5) of fasted male Sprague-Dawley rats (weight, 250 to 450 g) receive a bolus (at a volume of 1mL/kg of body weight) of Efavirenz in DMSO via a cannula implanted in the right jugular vein. For oral studies, rats are dosed by gavage by using a suspension of Efavirenz prepared in 0.5% aqueous methylcellulose. Similarly, four monkeys receive either an i.v. bolus of the compound in DMSO via the saphenous vein at a volume of 0.1 mL/kg or are administered the compound orally in suspension by using a nasogastric tube. Monkeys are fasted for 18 h prior to dosing. One nonanesthetized, nonfasted male chimpanzee (weight, approximately 60 kg) is dosed orally by voluntary ingestion by using an aqueous suspension of the compound. In all studies, heparinized blood is obtained at appropriate times. Plasma is separated immediately by centrifugation and is stored at -20°C until analysis. Plasma samples are extracted with methylene chloride; this is followed by analysis by high-performance liquid chromatography. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Chem Biol. 2022 Nov 10.
- Proc Natl Acad Sci U S A. 2022 Jul 5;119(27):e2200260119.
- Int J Antimicrob Agents. 2019 Dec;54(6):814-819.
- Nutr Res. 2023 Sep 17.
- Int J Med Microbiol. 2021 Oct;70(10).

See more customer validations on www.MedChemExpress.com

REFERENCES

[1]. Young SD, et al. L-743, 726 (DMP-266): a novel, highly potent nonnucleoside inhibitor of the human immunodeficiency virus type 1 reverse transcriptase. Antimicrob Agents Chemother. 1995 Dec;39(12):2602-5.

[2]. Held DM, et al. Differential susceptibility of HIV-1 reverse transcriptase to inhibition by RNA aptamers in enzymatic reactions monitoring specific steps during genome replication. J Biol Chem. 2006 Sep 1;281(35):25712-22.

[3]. Grobler JA, et al. HIV-1 reverse transcriptase plus-strand initiation exhibits preferential sensitivity to non-nucleoside reverse transcriptase inhibitors in vitro. J Biol Chem. 2007 Mar 16;282(11):8005-10.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA