Bemnifosbuvir

Cat. No.: HY-137958A

CAS No.: 1998705-64-8

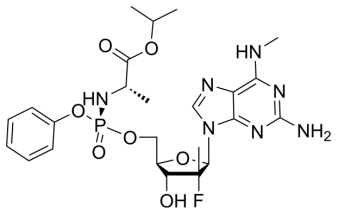
Molecular Formula: $C_{24}H_{33}FN_7O_7P$

Molecular Weight: 581.53

Target: HCV; SARS-CoV

Pathway: Anti-infection

Storage: 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 200 mg/mL (343.92 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.7196 mL	8.5980 mL	17.1960 mL
	5 mM	0.3439 mL	1.7196 mL	3.4392 mL
	10 mM	0.1720 mL	0.8598 mL	1.7196 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 (4.30 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (4.30 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (4.30 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Bemnifosbuvir (AT-511) is a potent and orally active HCV viral replication inhibitor. Bemnifosbuvir is highly effective in the control of SARS-CoV-2 (COVID-19) infection in vitro (EC_{90}=0.47 μM). Bemnifosbuvir has pangenotypic antiviral activity[1][2][3].

IC_{50} & Target

EC50: 5-28 nM (HCV)[1]
EC90: 0.47 μM (SARS-CoV-2)[2]

In Vitro

Bemnifosbuvir has pan-genotypic antiviral activities that inhibits HCV genotype 1a (HCV GT1a), HCV GT1b, HCV GT2a, HCV GT3a, HCV GT4a, and HCV GT5a replication with EC_{50} values of 12.8 nM, 12.5 nM, 9.2 nM, 10.3 nM, 14.7 nM, and 28.5 nM, respectively[1].

	In normal human airway epithelial cells, the concentration of Bemnifosbuvir required to inhibit replication of SARS-CoV-2 by EC_{90} is 0.47 μM, very similar to its EC_{90} against HCoV-229E, HCoV-OC43 and SARS-CoV in Huh-7 cells[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	When given orally to rats (500 mg/kg) and monkeys (30 mg/kg, 100 mg/kg or 300 mg/kg), Bemnifosbuvir preferentially delivers high levels of AT-9010 in the liver in vivo[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- bioRxiv. December 23, 2021.

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REFERENCES

[1]. Steven S Good, et al. Preclinical evaluation of AT-527, a novel guanosine nucleotide prodrug with potent, pan-genotypic activity against hepatitis C virus. PLoS One. 2020 Jan 8;15(1):e0227104.

[2]. Steven S Good, et al. AT-527, a double prodrug of a guanosine nucleotide analog, is a potent inhibitor of SARS-CoV-2 in vitro and a promising oral antiviral for treatment of COVID-19. Antimicrob Agents Chemother. 2021 Feb 8;AAC.02479-20.

[3]. Elina Berliba, et al. Safety, pharmacokinetics and antiviral activity of AT-527, a novel purine nucleotide prodrug, in HCV-infected subjects with and without cirrhosis. Antimicrob Agents Chemother. 2019 Sep 30;63(12):e01201-19.

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