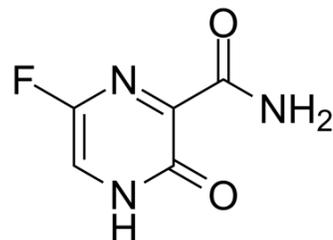


Favipiravir

Cat. No.:	HY-14768		
CAS No.:	259793-96-9		
Molecular Formula:	C ₅ H ₄ FN ₃ O ₂		
Molecular Weight:	157.1		
Target:	DNA/RNA Synthesis; Influenza Virus; SARS-CoV		
Pathway:	Cell Cycle/DNA Damage; 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 (636.54 mM)
 H₂O : 6.25 mg/mL (39.78 mM; Need ultrasonic)
 * "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	6.3654 mL	31.8269 mL	63.6537 mL
	5 mM	1.2731 mL	6.3654 mL	12.7307 mL
	10 mM	0.6365 mL	3.1827 mL	6.3654 mL

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

In Vivo

- Add each solvent one by one: 1% DMSO >> 99% saline
Solubility: ≥ 0.5 mg/mL (3.18 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.5 mg/mL (15.91 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
Solubility: ≥ 2.5 mg/mL (15.91 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: ≥ 2.5 mg/mL (15.91 mM); Clear solution
- Add each solvent one by one: 5% DMSO >> 40% PEG300 >> 5% Tween-80 >> 50% saline
Solubility: ≥ 2.5 mg/mL (15.91 mM); Clear solution
- Add each solvent one by one: 5% DMSO >> 95% (20% SBE-β-CD in saline)
Solubility: ≥ 2.5 mg/mL (15.91 mM); Clear solution
- Add each solvent one by one: PBS
Solubility: 4.55 mg/mL (28.96 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description	Favipiravir (T-705) is a potent viral RNA polymerase inhibitor, it is phosphoribosylated by cellular enzymes to its active form, Favipiravir-ribofuranosyl-5'-triphosphate (RTP). Favipiravir-RTP inhibits the influenza viral RNA-dependent RNA polymerase (RdRP) activity with an IC ₅₀ of 341 nM.
IC₅₀ & Target	IC ₅₀ : 341 nM (RdRP) ^[1]
In Vitro	<p>Favipiravir (T 705) is an antiviral drug that selectively inhibits the RNA-dependent RNA polymerase of influenza virus. Favipiravir (T 705) is a novel antiviral compound that selectively and potently inhibits the RNA-dependent RNA polymerase (RdRP) of influenza and many other RNA viruses. Favipiravir-RTP does not inhibit the human DNA polymerase α, β or γ with IC₅₀>1 mM. The IC₅₀ for the human RNA polymerase II is 905 μM; Favipiravir is therefore 2,650 times more selective for the influenza virus RdRP, consistent with the lack of inhibition of host-cell DNA and RNA synthesis^[1]. Favipiravir (T 705) acts as a pro-drug, its cytotoxicity is expected to be cell-line dependent. Favipiravir inhibits in a dose-dependent manner MNV-induced CPE (EC₅₀: 250\pm11 μM) and MNV RNA synthesis in cell culture (EC₅₀:124\pm42 μM). Despite this rather modest antiviral activity, Favipiravir (T 705) is able to completely inhibit norovirus replication at a concentration of 100 μg/mL, which is a concentration that has little or no adverse effect on the host cell (cell viability >80%)^[2].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>
In Vivo	<p>Favipiravir (T 705) (30 mg/kg/day, orally) improves survival compare to placebo. Favipiravir (T 705) also provides significant protection against the A/Duck/MN/1525/81(H5N1) virus at a dose of 33 mg/kg/day or more, regardless of the number of daily doses. When given 4 times a day, all mice survive^[1].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>

PROTOCOL

Cell Assay ^[2]	<p>The antiviral activity of Favipiravir (T 705) is determined using an MTS-based CPE reduction assay in the MNV/RAW 264.7 cell line. To this end, RAW 264.7 cells are seeded (1×10^4 cells/well) in 96-well plates and infected with MNV at an MOI of 0,001 in the presence (or absence) of a dilution series of Favipiravir (T 705) (3.13-200 μg/mL). Following 3 days of incubation, i.e. until complete CPE is observed in infected untreated cells, cell culture supernatants are collected for quantification of viral RNA load by quantitative RT-PCR (qRT-PCR). For the MTS reduction assay an MTS/Phenazine methosulphate (PMS) stock solution (2 mg/mL MTS and 46 g/mL PMS in PBS at pH 6-6.5) is diluted 1/20 in MEM. To each well, 75 μL of MTS/PMS solution is added and the optical density (OD) is read at 498 nm 2 h later. The % CPE reduction is calculated as $[(OD_{\text{treated}})_{\text{MNV}} - OD_{\text{VC}}] / [OD_{\text{CC}} - OD_{\text{VC}}] \times 100$, where OD_{CC} represents the OD of the uninfected untreated cells, whereas OD_{VC} and (OD_{treated})_{CC} represent the OD of infected untreated cells and virus-infected cells treated with a compound concentration, respectively. The EC₅₀ is defined as the compound concentration that protected 50% of cells from virus-induced CPE. Adverse effects of the molecule on the host cell are also assessed by means of the MTS-method, by exposing uninfected cells to the same concentrations of Favipiravir for 3 days. The % cell viability is calculated as $(OD_{\text{treated}}/OD_{\text{CC}}) \times 100$, where OD_{CC} is the OD of uninfected untreated cells and OD_{treated} are uninfected cells treated with compound. The CC₅₀ is defined as the compound concentration that reduces the number of viable cells by 50%. The selectivity index (SI) is calculated as CC_{50}/EC_{50}^[2].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>
Animal Administration ^[1]	<p>Mice^[1]</p> <p>Favipiravir (T 705) has also been shown to protect mice against lethal infection by a variety of influenza virus strains. When Favipiravir is orally administered 2 or 4 times a day for 5 days in mice infected with lethal doses of influenza virus A/Victoria/3/75(H3N2), A/Osaka/5/70(H3N2) or A/Duck/MN/1525/81(H5N1).</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>

CUSTOMER VALIDATION

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- Nucleic Acids Res. 2021 Jan 8;49(D1):D1113-D1121.
 - Antimicrob Agents Chemother. 2020 Jun 23;64(7):e00222-20.
 - Antimicrob Agents Chemother. 2019 May 24;63(6). pii: e00003-19.
 - Int J Biol Sci. 2020; 16(15): 3100-3115.
 - Front Pharmacol. 2019 Oct 16;10:1203.

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REFERENCES

- [1]. Furuta Y, et al. Favipiravir (T-705), a novel viral RNA polymerase inhibitor. Antiviral Res. 2013 Nov;100(2):446-54.
- [2]. Rocha-Pereira J, et al. Favipiravir (T-705) inhibits in vitro norovirus replication. Biochem Biophys Res Commun. 2012 Aug 10;424(4):777-80.
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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