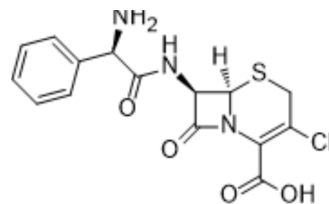


Cefaclor

Cat. No.:	HY-B0198		
CAS No.:	53994-73-3		
Molecular Formula:	C ₁₅ H ₁₄ ClN ₃ O ₄ S		
Molecular Weight:	367.81		
Target:	Bacterial; Antibiotic; Penicillin-binding protein (PBP); 5-HT Receptor		
Pathway:	Anti-infection; GPCR/G Protein; Neuronal Signaling		
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 : 18.5 mg/mL (50.30 mM; Need ultrasonic and warming)			
	H ₂ O : 3.85 mg/mL (10.47 mM; Need ultrasonic)			
		Solvent Concentration	Mass	
			1 mg	5 mg
			10 mg	
Preparing Stock Solutions	1 mM	2.7188 mL	13.5940 mL	27.1880 mL
	5 mM	0.5438 mL	2.7188 mL	5.4376 mL
	10 mM	0.2719 mL	1.3594 mL	2.7188 mL
	Please refer to the solubility information to select the appropriate solvent.			
In Vivo	1. Add each solvent one by one: 50% PEG300 >> 50% saline Solubility: 40 mg/mL (108.75 mM); Suspended solution; Need ultrasonic			
	2. Add each solvent one by one: PBS Solubility: 3.33 mg/mL (9.05 mM); Clear solution; Need ultrasonic and warming and heat to 60°C			

BIOLOGICAL ACTIVITY

Description	Cefaclor is a well-absorbed orally active cephalosporin antibiotic. Cefaclor can specifically bind to specific for penicillin-binding protein 3 (PBP3). Cefaclor can be used for the research of depression and kinds of infections caused by bacteria, such as respiratory tract infections, bacterial bronchitis, pharyngitis and skin infections ^{[1][2][3][4]} .			
IC₅₀ & Target	β-lactam	hOAT1	hPepT1- XXXXXXXX 1	hPepT2- XXXXXXXX 2
	CD63	BDNF	5-HT Receptor	
In Vitro	Cefaclor (0-500 μg/mL, 12-24 h) shows obvious antibacterial activity against 556 Gram-positive and Gram-negative isolates.			

The MIC values of most strains are lower than 3.1 µg/mL, and the MIC value of Staph. aureus is 1 µg/mL in vitro^[4]. Cefaclor (60/500 µM, 30 min) is mainly transported by hPepT2 and hPepT1 in the MDCK stably transduced cell line overexpressing hOAT1, hPepT1 and hPepT2^[2]. Cefaclor (0.16 mg/mL, 30 min) can induce allergic reactions by directly activating basophils and mast cells^[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Cefaclor (200 mg/kg/day, p.o. once a day for 5 days) can cause intestinal flora imbalance in mice, as well as anxiety and depression-like behaviors in mice. These symptoms can be alleviated by Fluoxetine (HY-B0102) or vagotomy^[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	C57BL/6J mice (male, 5 weeks old) ^[1]
Dosage:	200 mg/kg/day, once a day for 5 days.
Administration:	p.o.
Result:	Significantly decreased serotonin levels in the hippocampus and BDNF in mice. Cefaclor-induced gut dysbiosis caused anxiety and depression through the microbiota-gut-blood-brain and the microbiota-gut-vagus nerve-brain pathway.

CUSTOMER VALIDATION

- Nat Commun. 2023 Mar 22;14(1):1594.

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REFERENCES

- [1]. Joo MK, et al. Cefaclor causes vagus nerve-mediated depression-like symptoms with gut dysbiosis in mice. Sci Rep. 2023 Sep 19;13(1):15529.
- [2]. Li M, et al. Interactions of amoxicillin and cefaclor with human renal organic anion and peptide transporters. Drug Metab Dispos. 2006 Apr;34(4):547-55.
- [3]. Yoo HS, et al. Immunologic evaluation of immediate hypersensitivity to cefaclor. Yonsei Med J. 2014 Nov;55(6):1473-83.
- [4]. Neu HC, et al. Cefaclor: in vitro spectrum of activity and beta-lactamase stability. Antimicrob Agents Chemother. 1978 Apr;13(4):584-8.

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

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