Cefazolin

Cat. No.: HY-B1892

CAS No.: 25953-19-9

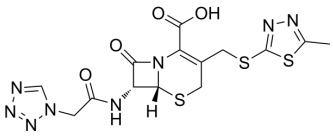
Molecular Formula: $C_{14}H_{14}N_8O_4S_3$

Molecular Weight: 454.51

Target: Antibiotic; Bacterial

Pathway: Anti-infection

Storage: 4°C, sealed storage, away from moisture
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 250 mg/mL (550.04 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.2002 mL	11.0009 mL	22.0017 mL
	5 mM	0.4400 mL	2.2002 mL	4.4003 mL
	10 mM	0.2200 mL	1.1001 mL	2.2002 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 (4.58 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (4.58 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.58 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Cefazolin (Cephazolin) is a first-generation cephalosporin antibiotic and can be used in varieties of bacterial infections research[1]. Cefazolin has anti-inflammatory effect and can attenuate post-operative cognitive dysfunction (POCD)[2].

IC_{50} & Target

β-lactam

In Vitro

Cefazolin (0-300 μg/ml; 6 or 24 h) has a direct anti-inflammatory effect on C8-B4 cells stimulated by lipopolysaccharide[2].
?Cefazolin (0-400 μM; 72 h) treatment inhibits IL-2, IL-4 and IL-15-induced cell proliferation[3].
?Cefazolin (100-400 μM; 30 min) treatment inhibits IL-2, IL-4, IL-15 and IL-21-stimulated JAK3 phosphorylation[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[2]

Cell Line:	C8-B4 cells
Concentration:	0, 50, 100, 150, 200, 250, or 300 μg/ml
Incubation Time:	6 or 24 hours
Result:	Inhibited the increase of IL-1β at all doses, but inhibited the increase of IL-6 only at 200 μg/ml.

Cell Proliferation Assay[3]

Cell Line:	PBMC, and TF-1 cells
Concentration:	0, 100, 200, and 400 μM
Incubation Time:	72 hours
Result:	Reduced IL-2, IL-4 and IL-15-induced cell proliferation, suggested that Cefazolin interferes not only with IL-15Rα, but also with IL-2/IL-15Rβ and/or γ_c.

Cell Proliferation Assay[3]

Cell Line:	PBMC, NK-92, and TF-1 cells
Concentration:	0, 100, 200, and 400 μM
Incubation Time:	30 min
Result:	Diminished the phosphorylation of JAK3 in response to the cytokine treatment, concluded suppressing signal transduction by γ_c receptors.

In Vivo

Cefazolin sodium pentahydrate (Subcutaneous injection; 300-500 mg/kg; once daily; 5 d) treatment improves learning and memory in mice after surgery[2].

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

Animal Model:	6- to 8-week-old male CD-1 mice underwent clinical exploratory laparotomy[2]
Dosage:	300-500 mg/kg
Administration:	Subcutaneous injection; 300-500 mg/kg; once daily; 5 days
Result:	Attenuated learning and memory dysfunction induced by the surgery.

CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 2;13(1):1116.
- Emerg Microbes Infect. 2024 Dec;13(1):2321981.
- mSystems. 2023 Dec 4:e0102623.
- iScience. 5 January 2022, 103731.
- Front Aging Neurosci. 2021 Oct 13;13:748637.

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REFERENCES

[1]. R Quintiliani, et al. Cefazolin. Ann Intern Med. 1978 Nov;89(5 Pt 1):650-6.

[2]. Peng Liang, et al. Perioperative use of cefazolin ameliorates postoperative cognitive dysfunction but induces gut inflammation in mice. J Neuroinflammation. 2018 Aug 22;15(1):235.

[3]. Barbara Żyżyńska-Granica, et al. The anti-inflammatory potential of cefazolin as common gamma chain cytokine inhibitor. Sci Rep. 2020 Feb 19;10(1):2886.

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

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