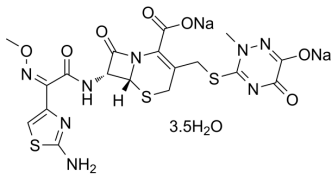
Ceftriaxone sodium hydrate

Cat. No.:	HY-B0712A
CAS No.:	104376-79-6
Molecular Formula:	$C_{18}H_{23}N_8Na_2O_{10.5}S_3$
Molecular Weight:	661.6
Target:	Bacterial; Antibiotic; GSK-3; Aurora Kinase
Pathway:	Anti-infection; PI3K/Akt/mTOR; Stem Cell/Wnt; Cell Cycle/DNA Damage; Epigenetics
Storage:	4°C, stored under nitrogen, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (stored under nitrogen, away from moisture)



BIOLOGICAL ACTIVITY

Description	Ceftriaxone sodium hydrate (Ro 13-9904 sodium hydrate) is a broad spectrum β-lactam third-generation cephalosporin antibiotic, which has good antibacterial activity against a variety of gram-negative and positive bacteria. Ceftriaxone sodium hydrate is a covalent inhibitor of GSK3β with IC_{50} value of 0.78 μM. Ceftriaxone sodium hydrate is an inhibitor of Aurora B. Ceftriaxone sodium hydrate has anti-inflammatory, antitumor and antioxidant activities. Ceftriaxone sodium hydrate can be used in the study of bacterial infections and meningitis[1][2][3][4][5][6][7].
IC_{50} & Target	β-lactam

In Vitro

Ceftriaxone sodium hydrate (100 μM, 24 h) protects MPP^+ treated astrocytes by inhibiting the NF-κB/JNK/c-Jun signaling pathway [3].

Ceftriaxone sodium hydrate (500 μM, 24-48 h) effectively inhibits unanchored cell growth in A549, H520 and H1650 lung cancer cells by inhibiting Aurora B[4].

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

Cell Viability Assay[3]

Cell Line:	Astrocyte
Concentration:	100 μM
Incubation Time:	24 h
Result:	Improved cell viability and increased glutamate uptake after MPP^+ expose.

Western Blot Analysis[3]

Cell Line:	Astrocyte
Concentration:	100 μM
Incubation Time:	24 h
Result:	Enhanced GLT-1 and GFAP expression. Decreased the expression of p-p50、p-IKKα、p-Relb. Decreased the number of TUNEL-positive cells.

In Vivo

Ceftriaxone sodium hydrate (200 mg/kg Intraperitoneal injection for 6 weeks) improves functional markers and oxidative stress and inflammation parameters in a rat model of D-galactose (DGL) -induced liver and kidney injury[5].
Ceftriaxone sodium hydrate (200, 400 mg/kg, Intraperitoneal injection) has a protective effect on convulsion induced by Pentylenetetrazol (PTZ) and PTZ-related oxidative damage in rats[6].
Ceftriaxone sodium hydrate (100, 200 mg/kg, Intraperitoneal injection) reduces mechanical dysodynia and hyperalgesia by activating GLT-1 in Streptozocin (HY-13753)-induced diabetic rat models[7].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	DGL-induced rat model[5]
Dosage:	200 mg/kg
Administration:	i.p.
Result:	Reduced the BUN、Cr、AST and ALT levels. Attenuated the MDA levels and enhanced GPx and CAT activities. Reduced the levels of IL-1β and TNF-α mRNA.

Animal Model:	PTZ-induced rat model[6]
Dosage:	200, 400 mg/kg
Administration:	i.p. 60 min before to PTZ (70 mg/kg)
Result:	Both of the two ceftriaxone groups had lower spike percentages than the saline group. Significantly lower MDA levels and higher SOD activity in 200 and 400 mg/kg.

CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 2;13(1):1116.
- EBioMedicine. 2022 Apr;78:103943.
- Chemosphere. 2023 Oct 3:344:140353.

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REFERENCES

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[2]. Nassar H, et al. Molecular docking, molecular dynamics simulations and in vitro screening reveal cefixime and ceftriaxone as GSK3β covalent inhibitors. RSC Adv. 2023 Apr 11;13(17):11278-11290.

[3]. Zhang Y, et al. Ceftriaxone Protects Astrocytes from MPP(+) via Suppression of NF-κB/JNK/c-Jun Signaling. Mol Neurobiol. 2015 Aug;52(1):78-92.

[4]. Li X, et al. Ceftriaxone, an FDA-approved cephalosporin antibiotic, suppresses lung cancer growth by targeting Aurora B. Carcinogenesis. 2012 Dec;33(12):2548-57.

[5]. Hakimizadeh E, et al. Ceftriaxone improves hepatorenal damages in mice subjected to D-galactose-induced aging. Life Sci. 2020 Oct 1;258:118119.

[6]. Uyanikgil Y, et al. Positive effects of ceftriaxone on pentylenetetrazol-induced convulsion model in rats. Int J Neurosci. 2016;126(1):70-5.

[7]. Gunduz O, et al. Anti-allodynic and anti-hyperalgesic effects of ceftriaxone in streptozocin-induced diabetic rats. Neurosci Lett. 2011 Mar 10;491(1):23-5.

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

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