Data Sheet (Cat.No.T0270L)

TargetMol

Hydrocortisone hemisuccinate sodium

Chemical Properties

CAS No. : 125-04-2

Formula: C25H33NaO8

Molecular Weight: 484.51

Storage: Keep away from moisture,
Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	Hydrocortisone hemisuccinate sodium, as a glucocorticoid, is an orally active steroidal anti-inflammatory agent (SAID) with both anti-inflammatory and immunomodulatory functions. It inhibits the biological activities of IL-6 and IL-3, with IC50 values of 6.7 μM and 21.4 μM, respectively. Hydrocortisone sodium succinate is also used in research related to ulcerative colitis (UC) and recurrent aphthous ulcers.
Targets(IC50)	Glucocorticoid Receptor,IL Receptor
In vitro	Method: Human peripheral blood lymphocytes (PBL) and T lymphocytes were stimulated with PHA and treated with different concentrations (0, 1.2, 6.0, 24, 60, 240, 600 × 10^{-7} M) of Hydrocortisone hemisuccinate for 72 h, followed by incubation with ^{14}C-thymidine for 20 h. Cell proliferation inhibition was measured using liquid scintillation counting. Result: Hydrocortisone hemisuccinate exhibited moderate immunosuppressive potency in vitro, with a relative potency 1/11 that of Methylprednisolone. It was significantly less potent than Methylprednisolone (P 0.0005) and Fluorohydrocortisone, but significantly more potent than its metabolites (Cortisone, Dihydrocortisol, Tetrahydrocortisol) and Aldosterone [1]. Method: Murine hybridoma MH60/BSF-2 cells (IL-6-dependent) were treated with Hydrocortisone sodium succinate (100 μM) in the presence of 1.2 unit/ml recombinant human IL-6 (rhIL-6) for 48 h. Cell proliferation was measured using the MTT assay, and the inhibition rate of IL-6 bioactivity was calculated. Result: Hydrocortisone sodium succinate achieved 92% ± 2% inhibition of IL-6 bioactivity at 100 μM, with an IC50 of 6.7 μM. It showed no cytotoxicity in IL-6-independent MH60 cells (IC50 > 100 μM), but exhibited moderate inhibitory effects in the IL-3 bioassay (IC50 = 21.4 μM) [2]. Method: Hydrocortisone sodium succinate was loaded into KGM-XG-GLY-SA hydrogel and release experiments were conducted under simulated gastrointestinal conditions: pH 1.2 phosphate buffer for 2 h, followed by pH 6.8 buffer for 4 h, and finally pH 7.4 buffer for 4 h (in some experiments, 10% colon tissue was added to the pH 7.4 buffer). The cumulative drug release rate at different time points was determined by HPLC. Result: The release of Hydrocortisone sodium succinate from the hydrogel was pH-dependent, with 23.40% release at pH 1.2 (2 h), 25.88% at pH 6.8 (4 h), and a significant increase to 70.20% at pH 7.4 (4 h). After the addition of 10% colon tissue, the cumulative release rate further increased from 70.20% to 81.05% within 10 h. The hydrogel without

In vitro	h), whereas the hydrogel containing glycerol released only 68% during the same period, indicating that glycerol exerts a significant sustained-release and lag effect on the hydrophilic drug HSS [3].
In vivo	Method: SD rats with TNBS-induced ulcerative colitis (UC) were orally administered Hydrocortisone sodium succinate loaded hydrogel (HSS-GEL) or HSS solution (30 mg/kg, twice daily for 5 consecutive days). Therapeutic effects were evaluated by DAI score, colonic MPO activity, and body weight changes. Additionally, rats were orally administered HSS or HSS-GEL (200 mg/kg, once daily for 10 consecutive days), and spleen and thymus indices were measured to assess adverse drug reactions. Pharmacokinetic studies were also conducted (plasma drug concentrations were measured after oral administration of HSS-GEL or HSS), along with determination of gastrointestinal drug residue distribution. Result: Compared with the HSS group, the HSS-GEL group significantly reduced DAI score ($P < 0.05$) and colonic MPO activity ($P < 0.01$), and attenuated body weight loss ($P < 0.05$), demonstrating superior therapeutic effects on UC. The spleen index and thymus index in the HSS-GEL group were significantly higher than those in the HSS group ($P < 0.05$, $P < 0.01$), indicating lower immunotoxicity. Pharmacokinetic results showed that, compared with the HSS group, the HSS-GEL group exhibited a 70.78% decrease in Cmax (44.37 vs. 151.87 μg/mL), a 58.21% decrease in AUC (242.58 vs. 580.43 μg·h/L) ($P < 0.01$), and a prolongation of Tmax from 0.68 h to 1.71 h. Gastrointestinal drug residue distribution showed that HSS-GEL reached maximum drug concentration in the colon and cecum at 7 h post-administration, demonstrating its colon-targeting properties [3].

Solubility Information

Solubility	DMSO: 140 mg/mL (288.95 mM),Sonication is recommended. H2O: 80 mg/mL (165.12 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	2.0639 mL	10.3197 mL	20.6394 mL
5 mM	0.4128 mL	2.0639 mL	4.1279 mL
10 mM	0.2064 mL	1.032 mL	2.0639 mL
50 mM	0.0413 mL	0.2064 mL	0.4128 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Langhoff E, et al. The immunosuppressive potency in vitro of physiological and synthetic steroids on lymphocyte cultures. Int J Immunopharmacol. 1987;9(4):469-473.
Kang BS, et al. Inhibitory effects of anti-inflammatory drugs on interleukin-6 bioactivity. Biol Pharm Bull. 2001;24 (6):701-703.
You YC, et al. In vitro and in vivo application of pH-sensitive colon-targeting polysaccharide hydrogel used for ulcerative colitis therapy. Carbohydr Polym. 2015;130:243-253.