# Product Data Sheet

Product Name: Hydrocortisone

Cat. No.: GC11551

## Chemical Properties

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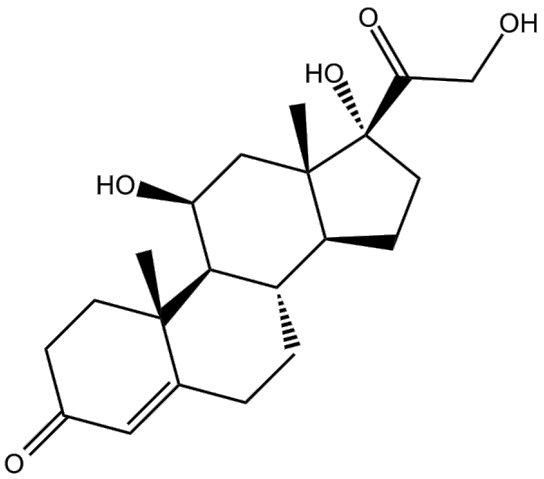
|---|---|---|---|
| Cas No. | 50-23-7 | | |
| 化学名 | (8S,9S,10R,11S,13S,14S,17R)-11,17-dihydroxy-17-(2-hydroxyacetyl)-10,13-dimethyl-2,6,7,8,9,11,12,14,15,16-decahydro-1H-cyclopenta[a]phenanthren-3-one | | |
| Canonical SMILES | CC12CCC(=O)C=C1CCC3C2C(CC4(C3CCC4(C(=O)CO)O)C)O | | |
| 分子式 | $C_{21}H_{30}O_5$ | 分子量 | 362.46 |
| 溶解度 | ≥ 13.3mg/mL in DMSO | 储存条件 | 4°C, protect from light |
| General tips | For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months. | | |
| Shipping Condition | Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request. | | |

Structure




## Protocol

**Cell experiment [1]:**

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| Cell lines | The human umbilical cord vein cell line EA.hy.926 |
| Preparation Method | DHA at 0.1, 1 and 10μM, hydrocortisone at 0.5μg/mL or vehicle control. After 24h incubation with the pre-treatment, cells were challenged with recombinant human TNFα (50ng/ml) and IL-1β (10ng/mL). |
| Reaction Conditions | 0.5μg/mL for 24 hours |
| Applications | In the same inflammatory conditions, pre-treatment with hydrocortisone induced a return to baseline, whereas DHA induced an increase of DHA-derived oxylipins that remains subtle at 0,1 and 1 μM, to reach more than half of the total oxylipin output at 10 μM. |

**Animal experiment [2]:**

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| Animal models | C57BL/6 mice |

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

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|---|---|
| Preparation Method | In the hydrocortisone group, mice were subcutaneously injected with 1.5 mg/kg hydrocortisone at 1 h after sepsis induction. |
| Dosage form | Subcutaneously injection, 1.5 mg/kg |
| Applications | Model mice were treated with hydrocortisone at 1 h after sepsis induction. After 12 h, the kidney tissue and blood samples were collected. After CLP, the kidney function biomarkers SCR and BUN were significantly elevated in the blood sample of mice, but this elevation was blocked by hydrocortisone treatment. |

References:
[1]: A.C.Mottaa. K.Strassburg. P.Oranjea, R.J.Vreekenbc, D.M.Jacobsa, et al. Oxylipin profiling in endothelial cells in vitro - Effects of DHA and hydrocortisone upon an inflammatory challenge. 2019. Prostaglandins & Other Lipid Mediators. 144.doi. org/10.1016/j.prostaglandins.2019.106352
[2]: L Jin, W Liao, X Zhou, Y Wang, J Qian, et al. Hydrocortisone alleviates sepsis-induced acute kidney injury through HSF-1-mediated transcriptional suppression of XPO1. Tissue and Cell. 2022. 79. doi.org/10.1016/j.tice.2022.101915.

## Background

Hydrocortisone, a natural glucocorticoid secreted by adrenal and extra-adrenal tissues, locally governs the transcription of genes involved in inflammation, immune response, metabolism, and energy homeostasis via binding to its cognate glucocorticoid receptor (GR) [1]. Glucocorticoids as hydrocortisone and methylprednisolone are known as ABCB1 substrates [2].

Hydrocortisone was observed to significantly decrease co-culture-induced pp38 MAPK expression in bothpancreatic acinar cells (PACs) and stellate cells (PSCs). The 10 nM concentration of hydrocortisone used in the study was significantly lower than the lowest normal serum cortisol level of approximately 140 nM in human sera [3].

The Hydrocortisone treatment alleviates sepsis-induced acute kidney injury in mice through HSF-1-mediated transcriptional suppression of XPO1 [4]. Hydrocortisone (70, 140 or 200 mg/kg) treated mice with i.p. injection of did not change either number or percentage of bone marrow B cell subsets. After 24 h of a single i.p. injection of 140 mg/kg of hydrocortisone a reduction in thymus weight and number of thymocytes could be observed. When mice were i.p. injected with hydrocortisone for three consecutive days, there was a depletion of the percentage and number of progenitors and lymphocytes [2].

References:
[1]. Sridharan, K., Rathore, B., Yousuf, M., Reddy Rachamalla, H. K., Jinka, S., Jaggarapu, M. M. C. S., & Banerjee, R. (2021). Self-assembling derivative of hydrocortisone as glucocorticoid receptor-targeted nanotherapeutics for synergistic, combination therapy against colorectal tumor. Molecular Pharmaceutics, 18(3), 1208- 1228.
[2]. Costa K.M.D, Valente R.C, Silva J.M.C.D, Paiva L.S, Rumjanek V.M, Glucocorticoid susceptibility and in vivo ABCB1 activity differ in murine B cell subsets. An. Acad. Bras. Cienc. 2018; 90 (30304236): 3081-3097. 10.1590/0001-3765201820180364
[3]. BlÄuer, M.; Sand, J.; Laukkarinen, J. Regulation of p38 MAPK and glucocorticoid receptor activation by hydrocortisone in mono-and co-cultured pancreatic acinar and stellate cells. Pancreatology 2021, 21, 384-389.
[4]. L Jin, W Liao, X Zhou, Y Wang, J Qian, et al. Hydrocortisone alleviates sepsis-induced acute kidney injury through HSF-1-mediated transcriptional suppression of XPO1. Tissue and Cell. 2022. 79. doi.org/10.1016/j.tice.2022.101915.

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