Small Molecules

Hydrocortisone

Enhances proliferation and differentiation of endothelial, epithelial, mesenchymal, and oligodendrocyte cells

Catalog #74142 100 mg
74144 1 g

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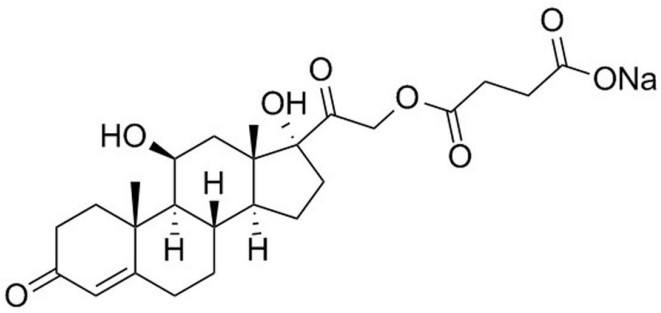
Product Description

Hydrocortisone is a glucocorticoid hormone with anti-inflammatory and immunosuppressive effects (Kang et al.; Langhoff & Ladefoged). It is also commonly used as a supplement for endothelial, epithelial, mesenchymal, or oligodendrocyte cell culture media, as it supports growth and differentiation. This product is supplied as the sodium salt of hydrocortisone 21-hemisuccinate, which is a more water-soluble form of hydrocortisone. Hydrocortisone is required as a supplement in MyeloCult™ H5100 (Human; Catalog #05100) for long-term cultures and the long-term culture-initiating cell (LTC-IC) assay. For complete instructions, refer to the Technical Manual for Human (Document #28412) or Mouse (Document #10000005500) LTC-IC Assays, available at www.stemcell.com, or contact us to request a copy.

Molecular Name:	Hydrocortisone
Alternative Names:	Cortisol 21-hemisuccinate; Hydrocortisone sodium succinate; ST51037292; U-4905
CAS Number:	125-04-2
Chemical Formula:	$C_{25}H_{33}O_8 \bullet Na$
Molecular Weight:	484.5 g/mol
Purity:	≥ 98%
Chemical Name:	21-(3-carboxy-1-oxopropoxy)-11β,17-dihydroxy-pregn-4-ene-3,20-dione, monosodium salt
Structure:	



Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. For long-term storage, store with a desiccant. Stable as supplied for12 months from date of receipt.
Solubility:	• PBS (pH 7.2) ≤ 20 mM • DMSO ≤ 60 mM • Absolute ethanol ≤ 40 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 10 mg in 2.06 mL of DMSO. Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

MAINTENANCE AND SELF-RENEWAL
· Enhances proliferation and self-renewal of limbal stem cells in explant cultures (Yu et al.).
· Supports long-term growth of immature human myeloid cells in culture (Salahuddin et al.).
· Increases the activity of glucose 6-phosphate dehydrogenase in mouse mammary epithelial cells in culture in the presence of insulin (Oka & Perry).

DIFFERENTIATION
· With ATRA, EGF, KGF, and HGF, promotes epithelial differentiation of adipose-derived stem cells (Li et al.).
· Promotes differentiation of mouse embryonic stem (ES) cell-derived definitive endoderm toward lung alveolar epithelial cells (Mokhber Dezfouli et al.).

IMMUNOLOGY
· Inhibits the bioactivity of the proinflammatory cytokine interleukin 6 (IC_{50} = 6.7 mM; Kang et al.).
· Suppresses the activity on phytohemagglutinin (PHA)-stimulated lymphocytes in vitro (Langhoff & Ladefoged).

References

Kang BS et al. (2001) Inhibitory effects of anti-inflammatory drugs on interleukin-6 bioactivity. Biol Pharm Bull 24(6): 701–3.

Langhoff E & Ladefoged J. (1983) Relative immunosuppressive potency of various corticosteroids measured in vitro. Eur J Clin Pharmacol 25(4): 459–62.

Li H et al. (2012) Effects of multiple agents on epithelial differentiation of rabbit adipose-derived stem cells in 3D culture. Tissue Eng Part A 18(17–18): 1760–70.

Mokhber Dezfouli MR et al. (2019) Hydrocortisone promotes differentiation of mouse embryonic stem cell-derived definitive endoderm toward lung alveolar epithelial cells. Cell J 20(4): 469–76.

Oka T & Perry JW. (1974) Studies on the function of glucocorticoid in mouse mammary epithelial cell differentiation in vitro. Stimulation of glucose 6-phosphate dehydrogenase. J Biol Chem 249(11): 3586–91.

Salahuddin SZ et al. (1981) Long-term suspension cultures of human cord blood myeloid cells. Blood 58(5): 931–8.

Yu M et al. (2016) An important role for adenine, cholera toxin, hydrocortisone and triiodothyronine in the proliferation, self-renewal and differentiation of limbal stem cells in vitro. Exp Eye Res 152: 113–22.

Related Small Molecules

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This product is hazardous. Please refer to the Safety Data Sheet (SDS).