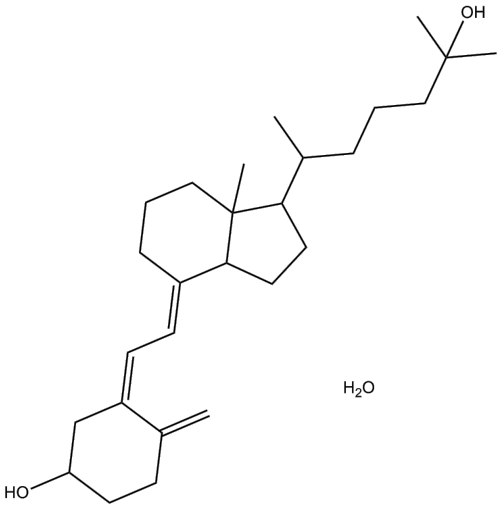
Product Data Sheet

Product Name: Calcifediol monohydrate
Cat. No.: GC16720

Chemical Properties

Cas. No.	63283-36-3		
Chemical Name	(1S,3Z)-3-[(2E)-2-[(1R,3aS,7aR)-1-[(2R)-6-hydroxy-6-methylheptan-2-yl]-7a-methyl-2,3,3a,5,6,7-hexahydro-1H-inden-4-ylidene]ethylidene]-4-methylidenecyclohexan-1-ol;hydrate		
SMILES	CC(CCCC(C)(C)O)C1CCC2C1(CCCC2=CC=C3CC(CCC3=C)O)C.O		
Formula	$C_{27}H_{46}O_3$	M.Wt	418.65
Solubility	DMSO : 50 mg/mL (119.43 mM);Soluble in Chloroform	Storage	Store at -20°C, protect from light
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C 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]:

Product Data Sheet

Cell lines	Neuroblastoma cells
Preparation Method	Cells were treated with Calcifediol monohydrate in a final concentration of 100nM or solvent control (EtOH).
Reaction Conditions	100nM; 24h
Applications	Calcifediol monohydrate decreased amyloid-β (Aβ)-production and increased Aβ-degradation in neuroblastoma cells.

Animal experiment [2]:

Animal models	Atopic dermatitis (AD) mice model (Female BALB/c mice)
Preparation Method	The AD mice model was induced by using DNCB. 1% DNCB was applied once a day to the ears (5μL) of AD-induced mice on days 6, 10, 14, and 18. The treatment was started on the day of challenge (day 6) with an intraperitoneal injection of 100μL Calcifediol monohydrate(5μg/kg). Each dose was given once every two days for a total of seven doses.
Dosage form	5μg/kg, 100μL; 7 times; i.p
Applications	Calcifediol monohydrate treatment reduces inflammatory infiltration and edema in the ears of AD mice.

Product Data Sheet

References:
[1]. Grimm MOW, Thiel A, et,al. Vitamin D and Its Analogues Decrease Amyloid-β (Aβ) Formation and Increase Aβ-Degradation. Int J Mol Sci. 2017 Dec 19;18(12):2764. doi: 10.3390/ijms18122764. PMID: 29257109; PMCID: PMC5751363.
[2]. Lu R, Peng Z, et,al. Vitamin D attenuates DNCB-induced atopic dermatitis-like skin lesions by inhibiting immune response and restoring skin barrier function. Int Immunopharmacol. 2023 Sep;122:110558. doi: 10.1016/j.intimp.2023.110558. Epub 2023 Jun 30. PMID: 37393836.

Background

Calcifediol monohydrate (25-hydroxy Vitamin D3 monohydrate; 25(OH)D3) is a potent ligand for the vitamin D receptor (VDR) with gene regulatory and anti-proliferative properties, and functions as a vitamin D supplement and a VDR antagonist. As a precursor hormone in the vitamin D endocrine system (VDES), calcifediol undergoes hydroxylation in the liver to form the active hormone, calcitriol. This form of vitamin D can rapidly increase serum vitamin D levels [1-3].

Calcifediol monohydrate (100nM; 24h) decreased amyloid-β (Aβ)-production and increased Aβ-degradation in neuroblastoma cells. Effects were mediated by affecting the Aβ-producing enzymes BACE1 and γ-secretase [4]. Calcifediol monohydrate(10^{-5}M) can induce a rapid increase in Ca^{2+} levels in hADMSCs cells in vitro [5].

Calcifediol monohydrate (5μg/kg, 100μL; 7 times; i.p)significantly protected mice against DNCB-induced AD. Calcifediol monohydrate may reduce inflammatory cell infiltration and chemokines by inhibiting the phosphorylation of STAT3 and may restore skin barrier function through the downregulation of AQP3 protein expression and inhibition of cell proliferation in In AD mouse model [6]. After viral attack, mice supplemented with Calcifediol monohydrate(125mg/kg; p.o; 7 weeks) stimulated the production of both anti-inflammatory and pro-inflammatory cytokines [7].

References:
[1]. Castoldi A, Herr C, et,al. Calcifediol-loaded liposomes for local treatment of pulmonary bacterial infections. Eur J Pharm Biopharm. 2017 Sep;118:62-67. doi: 10.1016/j.ejpb.2016.11.026. Epub 2016 Nov 22. PMID: 27888144.
[2]. Zheng W, Duan B, et,al. Vitamin D-induced vitamin D receptor expression induces tamoxifen

Product Data Sheet

sensitivity in MCF-7 stem cells via suppression of Wnt/β-catenin signaling. Biosci Rep. 2018 Dec 7;38(6):BSR20180595. doi: 10.1042/BSR20180595. PMID: 30314996; PMCID: PMC6435469.
[3]. Lou YR, Molnár F, Peräkylä M, Qiao S, Kalueff AV, St-Arnaud R, Carlberg C, Tuohimaa P. 25-Hydroxyvitamin D(3) is an agonistic vitamin D receptor ligand. J Steroid Biochem Mol Biol. 2010 Feb 15;118(3):162-70. doi: 10.1016/j.jsbmb.2009.11.011. Epub 2009 Nov 26. PMID: 19944755.
[4]. Grimm MOW, Thiel A, Lauer AA, Winkler J, Lehmann J, Regner L, Nelke C, Janitschke D, Benoist C, Streidenberger O, Stötzel H, Endres K, Herr C, Beisswenger C, Grimm HS, Bals R, Lammert F, Hartmann T. Vitamin D and Its Analogues Decrease Amyloid-β (Aβ) Formation and Increase Aβ-Degradation. Int J Mol Sci. 2017 Dec 19;18(12):2764. doi: 10.3390/ijms18122764. PMID: 29257109; PMCID: PMC5751363.
[5]. Donati S, Palmini G, Romagnoli C, Aurilia C, Miglietta F, Falsetti I, Marini F, Zonefrati R, Galli G, Marcucci G, Iantomasi T, Brandi ML. In Vitro Non-Genomic Effects of Calcifediol on Human Preosteoblastic Cells. Nutrients. 2021 Nov 25;13(12):4227. doi: 10.3390/nu13124227. PMID: 34959778; PMCID: PMC8707877.
[6]. Lu R, Peng Z, Lian P, Wazir J, Gu C, Ma C, Wei L, Li L, Pu W, Liu J, Wang H, Su Z. Vitamin D attenuates DNCB-induced atopic dermatitis-like skin lesions by inhibiting immune response and restoring skin barrier function. Int Immunopharmacol. 2023 Sep;122:110558. doi: 10.1016/j.intimp.2023.110558. Epub 2023 Jun 30. PMID: 37393836.
[7]. Hayashi H, Okamatsu M, et,al. Oral Supplementation of the Vitamin D Metabolite 25(OH)D3 Against Influenza Virus Infection in Mice. Nutrients. 2020 Jul 5;12(7):2000. doi: 10.3390/nu12072000. PMID: 32635656; PMCID: PMC7400405.

Caution: Product has not been fully validated for medical applications. For research use only.
Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA