

Product Data Sheet

Product Name: rel- α -Vitamin E

Cat. No.: GC38840

Chemical Properties

Cas. No. 2074-53-5

SMILES OC1=C(C)C(C)=C2C(CC[C@](C)(CCC[C@H](C)CCC[C@H](C)CCCC(C)C)(C)O2)=C1C.[
Relative stereochemistry]

Formula $C_{29}H_{50}O_2$ M.Wt 430.71

Solubility Ethanol: 50 mg/mL (116.09 mM); Storage Store at -20°C
DMSO: 16.11 mg/mL (37.40 mM)

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.

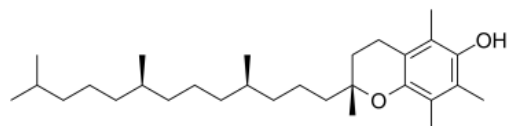
Caution: Product has not been fully validated for medical applications. For research use only.

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Structure



Relative stereochemistry

Protocol

Cell experiment [1]:

Cell lines

ORL-48 cells (human oral squamous carcinoma cell line), human epidermal keratinocytes (HEK)

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Preparation Method	ORL-48 cells and HEK were maintained in DMEM F-12 medium supplemented with 10% FBS or Cnt.Prime media at 37°C, 5% CO₂. ORL-48 cells were treated with rel-α-Vitamin E at 2.5µg/mL for 3-72 hours. Following treatment, cell viability was assessed by neutral red assay, morphological changes by time-lapse microscopy, ultrastructural changes by TEM, DNA fragmentation by agarose gel electrophoresis, apoptosis by TUNEL and Annexin V-FITC/PI flow cytometry, and cell cycle distribution by PI staining flow cytometry.
Reaction Conditions	2.5µg/mL; 3-72 hours
Applications	rel-α-Vitamin E inhibited ORL-48 proliferation. rel-α-Vitamin E induced cell shrinkage at 3h, apoptotic bodies at 24h, gradual reduction of cell population up to 72h, chromatin condensation and membrane blebbing. rel-α-Vitamin E caused DNA smearing without ladder pattern, increased TUNEL-positive and Annexin V⁺/PI⁻ cells, and induced Sub G0 and G0/G1 cell cycle arrest.
Animal experiment [2]:	
Animal models	C57BL/6 male mice (8 weeks old)
Preparation Method	C57BL/6 male mice were divided into control, LPS, LPS+low-dose rel-α-Vitamin E (100mg/kg) and LPS+high-dose rel-α-Vitamin E (200mg/kg) groups; rel-α-Vitamin E was administered intragastrically daily for 2 weeks before intratracheal LPS (5mg/kg) injection, then lung tissue was collected 1 day after LPS injection for W/D weight ratio, BALF neutrophil count, ELISA, HE staining, IHC and Western blot.
Dosage form	100-200mg/kg; intragastric; daily for 2 weeks before LPS

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Applications	rel- α -Vitamin E improved lung tissue edema, reduced BALF neutrophil infiltration, lowered lung and BALF IL-1 β , IL-6 and TNF- α expression, increased lung SOD1/2 and serum SOD and GSH-Px levels, reduced serum MPO and MDA levels, and decreased p65 and p-p65 expression with increased I κ B α in lung tissue.
References: [1] Zulkapli R, Abdul Razak F, Zain RB. Vitamin E(α -Tocopherol) Exhibits Antitumour Activity on Oral Squamous Carcinoma Cells ORL-48. Integr Cancer Ther. 2017 Sep;16(3):414-425. [2] Hu M, Yang J, Xu Y. Effect of α -tocopherol in alleviating the lipopolysaccharide-induced acute lung injury via inhibiting nuclear factor kappa-B signaling pathways. Bioengineered. 2022;13(2):3958-3968.	

Background

rel- α -Vitamin E is a lipophilic chain-breaking antioxidant. rel- α -Vitamin E scavenges peroxy radicals to inhibit lipid peroxidation and protects long-chain polyunsaturated fatty acids from oxidative damage. rel- α -Vitamin E downregulates GPIIb expression to reduce platelet aggregation and inhibits lymphocyte and eosinophil recruitment. rel- α -Vitamin E can be used in the research of cardiovascular diseases, diabetic nephropathy and oxidative stress-related diseases^[1-4].

In vitro, 32 μ g/mL rel- α -Vitamin E was used to treat C18-4 cells for 24-72 hours. rel- α -Vitamin E enhanced cell proliferation and DNA synthesis, upregulated BMI1 expression, increased phos-AKT levels and decreased γ -H2AX levels^[5]. 2.5 μ g/mL rel- α -Vitamin E was used to treat ORL-48 cells for 3-72 hours. rel- α -Vitamin E caused cell shrinkage and led to a gradual reduction of the cell population^[6]. 10-20 μ M rel- α -Vitamin E and Aristolochic acids were used to treat NRK-52E cells for 24 hours. rel- α -Vitamin E reduced Aristolochic acids-induced H₂O₂ level upregulation, improved cell survival rate and decreased cleaved caspase-3 levels^[7].

In vivo, *Trypanosoma cruzi* Tulahuen strain-infected C57BL/6 mice received subcutaneous injections of 100mg/kg rel- α -Vitamin E once a week for 4 weeks. rel- α -Vitamin E reduced parasitemia and

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mortality, increased the number of T cells producing IFN- γ , increased the number of effector memory CD8⁺ T cells, and reduced inflammatory cell infiltration and collagen deposition fibrosis in the heart and skeletal muscle^[8]. C57BL/6 mice fed 1000IU/kg of rel- α -Vitamin E for 4 months. rel- α -Vitamin E increased levels of rel- α -Vitamin E and α -CEHC in the liver^[9]. C57BL/6 mice received daily intragastric administration of 100mg/kg or 200mg/kg rel- α -Vitamin E for 2 weeks before intratracheal injection of 5mg/kg lipopolysaccharide. rel- α -Vitamin E improved lung tissue edema, reduced bronchoalveolar lavage fluid neutrophil count and IL-1 β and IL-6 concentrations, reduced pulmonary interstitial edema and inflammatory cell infiltration, reduced IL-1 β and TNF- α protein expression in lung tissue, increased SOD1/2 expression in lung tissue and serum SOD and GSH-Px activities, and reduced serum MPO and MDA levels^[10].

References:

- [1] Moriguchi S, Muraga M. Vitamin E and immunity. Vitam Horm. 2000;59:305-36.
- [2] Icer MA, Arslan N, Gezmen-Karadag M. Effects of vitamin E on neurodegenerative diseases: an update. Acta Neurobiol Exp (Wars). 2021;81(1):21-33.
- [3] Shetty RA, Ikonne US, Forster MJ, et al. Coenzyme Q10 and α -tocopherol reversed age-associated functional impairments in mice. Exp Gerontol. 2014 Oct;58:208-218.
- [4] Reich E, Montine KS, Gross MD, et al. Interactions between apolipoprotein E gene and dietary α -tocopherol influence cerebral oxidative damage in aged mice. J Neurosci. 2001 Aug 15;21(16):5993-5999.
- [5] Peng M, Wu J, Wang W, et al. Alpha-tocopherol enhances spermatogonial stem cell proliferation and restores mouse spermatogenesis by up-regulating BMI1. Front Nutr. 2023 Apr 17;10:1141964.
- [6] Zulkapli R, Abdul Razak F, Zain RB. Vitamin E(α -Tocopherol) exhibits antitumour activity on oral squamous carcinoma cells ORL-48. Integr Cancer Ther. 2017 Sep;16(3):414-425.
- [7] Wu TK, Pan YR, Wang HF, et al. Vitamin E(α -tocopherol) ameliorates aristolochic acid-induced renal tubular epithelial cell death by attenuating oxidative stress and caspase-3 activation. Mol Med Rep. 2018 Jan;17(1):31-36.
- [8] Silva ACO, Bonfim M, Fontes JLM, et al. C57BL/6 Mice Pretreated With Alpha-Tocopherol Show

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a Better Outcome of Trypanosoma cruzi Infection With Less Tissue Inflammation and Fibrosis. Front Immunol. 2022 Jan 28;13:833560.

[9] Mustacich DJ, Gohil K, Bruno RS, et al. Alpha-Tocopherol Modulates Genes Involved in Hepatic Xenobiotic Pathways in Mice. J Nutr Biochem. 2009 Jun;20(6):469-476.

[10] Hu M, Yang J, Xu Y. Effect of α -tocopherol in alleviating the lipopolysaccharide-induced acute lung injury via inhibiting nuclear factor kappa-B signaling pathways. Bioengineered. 2022;13(2):3958-3968.

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