

Product Data Sheet

Product Name: Tocofersolan

Cat. No.: GC31315

Chemical Properties

Cas. No. 9002-96-4

SMILES CC1=C(CCC(CCCC(C)CCCC(C)CCCC(C)C)(C)O2)C2=C(C)C(C)=C1OC(CCC(OCCO)=O)=O.[n]

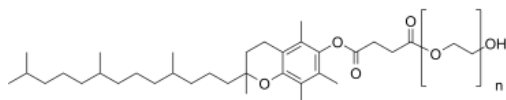
Formula $C_{35}H_{58}O_6$ M.Wt 1513.00

Solubility DMSO : 31.25 mg/mL (20.65 mM); Water : < 0.1 mg/mL (insoluble) 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]:

Cell lines Caco-2 cells

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

Product Data Sheet

Caco-2 cells were grown to 90% confluence in 75cm² T-flasks with DMEM supplemented with 10% FBS and 1% NEAA. Culture media were changed every second day, and cells were grown at a temperature of 37°C in an atmosphere of 85% relative humidity and 5% CO₂. Trypsinized Caco-2 cells were spin labeled by incubating a suspension (2.0×10⁷ cells/mL) in Krebs Ringer Buffer (KRB; pH 7.4) for 30min at 37°C with 0.5mM of a spin label stock solution (10mM 5-doxy stearic acid (5-SA) in ethanol). Different concentrations of Tocofersolan (3.3μM to 16.5mM) were added via stock solutions, and cell Preparation Method suspensions were incubated for 60min. After suspension centrifugation (4min at 1200g), supernatant was removed and the cell pellet was washed and resuspended in KRB to give a final concentration of 1.0×10⁸ cells/mL. To quench residual free spin label, chrome oxalate (final concentration 2.0mM) was added and the ensuing cell suspension (100μL) was filled into the test tube and placed in a 4103 TM/ 8609 cavity. ESR measurements were performed at room temperature using a Bruker ESP300 E spectrometer with an ER081 (90/30 C5) magnet. Cell membrane fluidity was depicted via the cell membrane order parameter *S*. *S* can be derived from the ESR spectral line splitting.

Reaction
Conditions 3.3μM to 16.5mM; 60min

Applications Tocofersolan had negligible effects on Caco-2 cell membrane fluidity at concentrations up to 0.33mM, but significant fluidization effects were observed at higher concentrations (above 1.65mM).

References:

[1] Collnot EM, Baldes C, Wempe MF, et al. Mechanism of inhibition of P-glycoprotein mediated efflux by vitamin E TPGS: influence on ATPase activity and membrane fluidity. *Mol Pharm.* 2007;4(3):465-474.

Background

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

Product Data Sheet

Tocofersolan is a polyethylene glycol derivative of α -tocopherol and is a water-soluble vitamin E analog^[1]. Tocofersolan has antioxidant activity and serves as an orally bioavailable source of vitamin E^[2]. Tocofersolan increases the solubility and bioavailability of some drugs, and improves their pharmacokinetic properties^[3]. Tocofersolan is usually used in drug delivery systems or nutraceuticals^{[4][5]}.

In vitro, Tocofersolan (3.3 μ M to 16.5mM; 60min) inhibited P-glycoprotein (P-gp) - mediated drug efflux in Caco-2 cells with an IC₅₀ of 5.86 μ M^[6].

In vivo, Tocofersolan (1 μ M) co-exposure for 5 days post-fertilization in larval zebrafish reversed the locomotor hypoactivity caused by benzo[a]pyrene (5 μ M) exposure^[7].

References:

- [1] Sadoqi M, Lau-Cam CA, Wu SH. Investigation of the micellar properties of the tocopheryl polyethylene glycol succinate surfactants TPGS 400 and TPGS 1000 by steady state fluorometry. *J Colloid Interface Sci.* 2009;333(2):585-589.
- [2] Thebaut A, Nemeth A, Le Mouhaer J, et al. Oral Tocofersolan Corrects or Prevents Vitamin E Deficiency in Children With Chronic Cholestasis. *J Pediatr Gastroenterol Nutr.* 2016;63(6):610-615.
- [3] Wande DP, Cui Q, Chen S, Xu C, Xiong H, Yao J. Rediscovering Tocophersolan: A Renaissance for Nano-Based Drug Delivery and Nanotheranostic Applications. *Curr Drug Targets.* 2021;22(8):856-869.
- [4] Tan S, Zou C, Zhang W, Yin M, Gao X, Tang Q. Recent developments in d- α -tocopheryl polyethylene glycol-succinate-based nanomedicine for cancer therapy. *Drug Deliv.* 2017;24(1):1831-1842.
- [5] Srivastava A, Lall R, Talukder J, DuBourdieu D, Gupta RC. Iron Transport Tocopheryl Polyethylene Glycol Succinate in Animal Health and Diseases. *Molecules.* 2019;24(23):4289.
- [6] Collnot EM, Baldes C, Wempe MF, et al. Mechanism of inhibition of P-glycoprotein mediated efflux by vitamin E TPGS: influence on ATPase activity and membrane fluidity. *Mol Pharm.* 2007;4(3):465-474.
- [7] Holloway Z, Hawkey A, Asrat H, Boinapally N, Levin ED. The use of tocofersolan as a rescue agent in larval zebrafish exposed to benzo[a]pyrene in early development. *Neurotoxicology.* 2021;86:78-84.

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