γ-Tocotrienol

Cat. No.: HY-108694

CAS No.: 14101-61-2

Molecular Formula: $C_{28}H_{42}O_2$

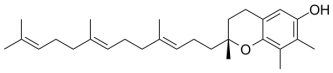
Molecular Weight: 410.63

Target: Endogenous Metabolite; NF-κB

Pathway: Metabolic Enzyme/Protease; NF-κB

Storage:

Pure form	-20°C	3 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (243.53 mM; Need ultrasonic)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	2.4353 mL	12.1764 mL	24.3528 mL
	5 mM	0.4871 mL	2.4353 mL	4.8706 mL
	10 mM	0.2435 mL	1.2176 mL	2.4353 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (6.09 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2.5 mg/mL (6.09 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (6.09 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

γ-Tocotrienol is an active form of vitamin E. γ-tocotrienol reverses the multidrug resistance (MDR) of breast cancer cells through the signaling pathway of NF-κB and P-gp. γ-Tocotrienol is also a novel radioprotector agent, can mitigate bone marrow radiation damage during targeted radionuclide treatment[1][2][3].

In Vitro

γ-Tocotrienol (25 μM; 24 h) effectively inhibits the expression levels of mdr1 mRNA and P-gp protein, (25 μM and 50 μM; 24 h) suppresses mdr1 promoter activity and the efflux activity of P-gp as well[2].
γ-Tocotrienol (25 μM and 50 μM; 24 h) reduces the activation of NF-κB signaling pathway and the transcriptional activity of NF-κB[2].

γ-tocotrienol (50 μM; 48 h) effectively inhibits the process of nuclear translocation of p65 which was induced by TNFα[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Immunofluorescence[2]

Cell Line:	MCF-7/Adr cells
Concentration:	50 μM
Incubation Time:	48 hours
Result:	Decreased the red fluorescence of p65 in the nucleus, indicating nuclear translocation inhibiton of p65 induced by TNFα.

In Vivo

γ-Tocotrienol's liposomal formulation, GT3-Nano (20 mol% γ-Tocotrienol), (10 mg/kg, 6 mol%; i.v.; single dose, observed for 100 d) is highly effective in mitigating the marrow-suppressive effects of sublethal and lethal TBI in mice[3].
GT3-Nano (50 mg/kg; i.v.;) can facilitate rapid recovery of hematopoietic components in mice treated with the endoradiotherapeutic agent ^{153}Sm-EDTMP[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	C57/BL6 mice (6-8 weeks old) treated with the whole-body irradiation[3]
Dosage:	16, 24, 32, and 50 mg/kg
Administration:	Intravenous injection; observed mice for 100 days
Result:	Demonstrated dose-dependent radioprotection, achieving 90% survival at 50 mg/kg against lethal 9-Gy of total-body irradiation (TBI). And upregulated progenitor bone marrow cells MPP2 and CMP in GT3-Nano-treated mice.

REFERENCES

[1]. Ding Y, et al. γ-Tocotrienol reverses multidrug resistance of breast cancer cells through the regulation of the γ-Tocotrienol-NF-κB-P-gp axis. J Steroid Biochem Mol Biol. 2021 May;209:105835.

[2]. Lee SG, et al. γ-Tocotrienol-Loaded Liposomes for Radioprotection from Hematopoietic Side Effects Caused by Radiotherapeutic Drugs. J Nucl Med. 2021 Apr;62(4):584-590.

[3]. M A Newaz, et al. Nitric Oxide Synthase Activity in Blood Vessels of Spontaneously Hypertensive Rats: Antioxidant Protection by Gamma-Tocotrienol. J Physiol Pharmacol. 2003 Sep;54(3):319-27.

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