

Product Data Sheet

Product Name: Squalene (Super Squalene)

Cat. No.: GC32216

Chemical Properties

Cas. No. 111-02-4

SMILES C/C(C)=C\CC/C(C)=C/CC/C(C)=C/CC/C=C(C)/CC/C=C(C)/CC/C=C(C)\C

Formula $C_{30}H_{50}$ M.Wt 410.72

Solubility DMSO : 16.67 mg/mL (40.59 mM); Water : < 0.1 mg/mL (insoluble) Storage Store at -20°C

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.

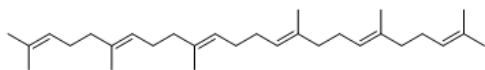
Caution: Product has not been fully validated for medical applications. For research use only.

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Structure



Protocol

Cell experiment [1]:	
Cell lines	MCF10A cells (immortalized non-tumourigenic human mammary epithelial cells), MCF7, MDA-MB-231 cells (human breast cancer cells)
Preparation Method	MCF10A, MCF7 and MDA-MB-231 cells were maintained in appropriate media (HuMEC Ready Medium for MCF10A; MEM with 10% FBS, 1% Hepes, 1% Sodium Pyruvate, 1% NEAA for MCF7 and MDA-MB-231) at 37°C, 5% CO ₂ . Cells were treated with Squalene at 3.12-50µM for 24-120h for proliferation assay; at 12.5-200µM for 24h for cell cycle, apoptosis, intracellular ROS and oxidative DNA damage detection.

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Reaction Conditions	3.12-50μM; 24-120h
Applications	Squalene did not significantly alter proliferation rates, cell cycle profile or apoptosis in MCF10A, MCF7 and MDA-MB-231 cells. Squalene decreased intracellular ROS levels in a dose-dependent manner and prevented H ₂ O ₂ -induced oxidative injury in MCF10A cells, but not in MCF7 or MDA-MB-231 cells. Squalene protected against H ₂ O ₂ -induced oxidative DNA damage in MCF10A cells in a dose-dependent manner, but showed no preventive effect in MCF7 or MDA-MB-231 cells.
Animal experiment [2]:	
Animal models	Male Wistar albino rats
Preparation Method	Male Wistar albino rats (133-158g) were maintained on standard diet with water ad libitum. After 7-day acclimatization, rats were divided into 4 groups (n=6 each); Group I received standard diet only, Groups II/III/IV were orally administered Squalene at 150-450mg/kg respectively for 45 days. Body weight recorded every 7 days; at day 45 rats were anesthetized with chloroform and sacrificed, serum collected for lipid profile (cholesterol, TG, LDL, VLDL, HDL via automated analyzer), liver/brain/kidney/heart harvested for 5% homogenate to measure CAT, SOD, AST, ALT activities.
Dosage form	150-450mg/kg; oral gavage; daily for 45 days

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Applications	Squalene increased weight gain percentage and specific growth rate. Squalene decreased serum cholesterol, triglycerides, LDL and VLDL levels and increased HDL level in a dose-dependent manner. Squalene decreased liver and brain catalase activity and liver/kidney/heart superoxide dismutase activity with increasing dose. Squalene decreased aspartate aminotransferase activity across liver/kidney/brain/heart and increased alanine aminotransferase activity in liver/kidney/heart with increasing dose.
References: [1] Warleta F, Campos M, Allouche Y, et al. Squalene protects against oxidative DNA damage in MCF10A human mammary epithelial cells but not in MCF7 and MDA-MB-231 human breast cancer cells. Food Chem Toxicol. 2010;48(5):1092-100. [2] Kumar LRG, Tejpal CS, Anas KK, et al. In Vivo Assessment of the Nutritional Efficacy of Encapsulated Squalene in Male Wistar Rats. Fishery Technology. 2025;62:337-43.	

Background

Squalene (Super Squalene) is a triterpenoid lipid with multiple pharmacological properties, including lipid-lowering, anti-atherosclerotic, antioxidant and antitumor effects. Squalene exerts antioxidant activity by quenching singlet oxygen. Squalene enhances antigen uptake and immune response in the form of squalene emulsion. Squalene regulates cholesterol metabolism through negative feedback inhibition of HMG-CoA reductase. Squalene can be used in research on cardiovascular diseases, cancer and vaccine adjuvants^[1-4].

In vitro, treatment of AML12 cells and TXNDC5-knockout AML12 cells with 30μM Squalene (loaded in PLGA nanoparticles) for 72 hours reduced ROS levels in wild-type cells and elevated ROS levels in TXNDC5-deficient cells^[5]. Treatment of ML162-induced Karpas299 cells with Squalene failed to reduce cell death^[6]. Treatment of H₂O₂-induced MCF10A cells with 3.12-50μM Squalene for 24-120 hours reduced intracellular ROS levels and protected cells against H₂O₂-induced oxidative DNA damage^[7].

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In vivo, a single intraperitoneal injection of 100mg/kg Squalene or weekly injections for 2 weeks given to BALB/c nude mice 3 hours before cisplatin or carboplatin administration significantly alleviated cisplatin- or carboplatin-induced body weight loss, reduced intracellular ROS levels in bone marrow cells, improved colony formation of light-density bone marrow cells, and protected colony-forming unit-fibroblast colonies against cisplatin or carboplatin toxicity^[8]. Oral gavage of 150-450mg/kg Squalene to Wistar albino rats for 45 days decreased serum cholesterol, triglycerides, low-density lipoprotein and very low-density lipoprotein levels, and increased high-density lipoprotein levels^[9]. Feeding wild-type mice, ApoA1-deficient mice and ApoE-deficient mice a diet supplemented with 1g/kg Squalene for 11 weeks increased plasma HDL-cholesterol, HDL esterified cholesterol and phosphatidylcholine, elevated plasma arylesterase activity and HDL-PON1, and upregulated hepatic Lcat/Pon1/Pon2 mRNA expression in wild-type mice; increased plasma HDL-cholesterol and plasma arylesterase activity in ApoA1-deficient mice; and increased plasma HDL-cholesterol in ApoE-deficient mice^[10].

References:

- [1] Smith TJ. Squalene: potential chemopreventive agent. Expert Opin Investig Drugs. 2000 Aug;9(8):1841-8.
- [2] Nair IM, Kochupurackal J. Squalene hopene cyclases and oxido squalene cyclases: potential targets for regulating cyclisation reactions. Biotechnol Lett. 2023 Jun;45(5-6):573-588.
- [3] Sabeena Farvin KH, Anandan R, Senthil Kumar SH, et al. Effect of squalene on tissue defense system in isoproterenol-induced myocardial infarction in rats. Pharmacol Res. 2004;50(2):231-6.
- [4] Berghoff SA, Spieth L, Sun T, et al. Microglia facilitate repair of demyelinated lesions via post-squalene sterol synthesis. Nat Neurosci. 2021 Jan;24(1):47-60.
- [5] Bidooki SH, Alejo T, Sanchez-Marco J, et al. Squalene Loaded Nanoparticles Effectively Protect Hepatic AML12 Cell Lines against Oxidative and Endoplasmic Reticulum Stress in a TXNDC5-Dependent Way. Antioxidants. 2022 Mar 18;11(3):581.
- [6] Garcia-Bermudez J, Baudrier L, Bayraktar EC, et al. Squalene accumulation in cholesterol auxotrophic lymphomas prevents oxidative cell death. Nature. 2019 Mar;567(7746):118-22.
- [7] Warleta F, Campos M, Allouche Y, et al. Squalene protects against oxidative DNA damage in

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MCF10A human mammary epithelial cells but not in MCF7 and MDA-MB-231 human breast cancer cells. Food Chem Toxicol. 2010 Apr;48(4):1092-1100.

[8] Das B, Antoon R, Tsuchida R, et al. Squalene selectively protects mouse bone marrow progenitors against cisplatin and carboplatin-induced cytotoxicity in vivo without protecting tumor growth. Neoplasia. 2008 Oct;10(10):1105-19.

[9] Kumar LRG, Tejpal CS, Anas KK, et al. In Vivo Assessment of the Nutritional Efficacy of Encapsulated Squalene in Male Wistar Rats. Fishery Technology. 2025;62(337-343):337-43.

[10] Gabas-Rivera C, Barranquero C, Martinez-Beamonte R, et al. Dietary Squalene Increases High Density Lipoprotein-Cholesterol and Paraoxonase 1 and Decreases Oxidative Stress in Mice. PLoS ONE. 2014 Aug 12;9(8):e104224.

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