

Product Data Sheet

Product Name: Salvianolic acid A

Cat. No.: GN10211

Chemical Properties

Cas. No. 96574-01-5

Chemical Name (2R)-3-(3,4-dihydroxyphenyl)-2-[(E)-3-[2-[(E)-2-(3,4-dihydroxyphenyl)ethenyl]-3,4-dihydroxyphenyl]prop-2-enoyl]oxypropanoic acid

SMILES C1=CC(=C(C=C1CC(C(=O)O)OC(=O)C=CC2=C(C(=C(C=C2)O)O)C=CC3=CC(=C(C=C3)O)O)O)O

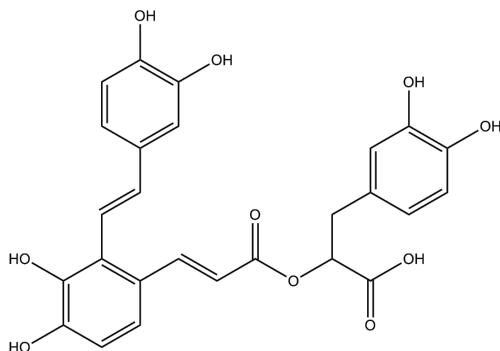
Formula $C_{26}H_{22}O_{10}$ M.Wt 494.45

Solubility $\geq 24.7\text{mg/mL}$ in Water with gentle warming Storage 4°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 HUVEC cells

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

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Preparation Method HUVEC cells were seeded in 96-well plates (1×10^4 cells/mL, 100 μ L/well), Cells were exposed to 200 μ M H₂O₂ for 12 h in serum-free medium following 24 h of normal culture. After H₂O₂ inducing, cells were treated with different concentrations of Salvianolic acid A (0, 0.25, 0.5, 1, 2, 4, 8, 16 μ M) for 24h. CCK-8 was added into each well and incubated at 37 °C for 2h. The absorbance was measured at 450nm.

Reaction Conditions 0, 0.25, 0.5, 1, 2, 4, 8, 16 μ M; 24h

Applications Salvianolic acid A improved the cell viability of H₂O₂ inducing HUVEC cells.

Animal experiment [2]:

Animal models Sprague-Dawley rats

Preparation Method Male Sprague-Dawley rats were received CCl₄ orally to induce liver fibrosis. Thereafter, the rats were intraperitoneally administered Salvianolic acid A (5 or 15mg/kg) once daily for 6 successive weeks. Blood samples were obtained from the abdominal aorta. The tissue samples of liver were fixed in 10% neutral formalin. Remaining tissues from the liver were stored at -80°C for future use.

Dosage form 5 and 10mg/kg/day for 6 weeks; i.p.

Applications Salvianolic acid A alleviated liver injury, fibrosis, hepatocyte apoptosis, and serum level of hydroxyproline.

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References:

- [1] QIAO X, CAO S, CHEN S, et al. Salvianolic acid A alleviates H₂O₂-induced endothelial oxidative injury via miR-204-5p [J]. Sci Rep, 2024, 14(1): 11931.
- [2] WANG R, SONG F, LI S, et al. Salvianolic acid A attenuates CCl₄-induced liver fibrosis by regulating the PI3K/AKT/mTOR, Bcl-2/Bax and caspase-3/cleaved caspase-3 signaling pathways [J]. Drug Des Devel Ther, 2019, 13:1889-1900.

Background

Salvianolic acid A is a polyphenolic compound with multi-target pharmacological activities. Salvianolic acid A inhibits the activity of the TGF- β 1 signaling pathway by targeting TGF- β receptor I (T β RI) and downregulates the expression of MMP9 protein^[1]. Salvianolic acid A is commonly used in cardiovascular diseases and organ fibrosis research. Derived from *Salvia miltiorrhiza* (Danshen), Salvianolic acid A suppresses mitochondrial lipid peroxidation, maintains ATPase activity, eliminates superoxide, and exhibits strong antioxidant and neuroprotective effects^[2]. Additionally, Salvianolic acid A demonstrates broad pharmacological activities, including anti-inflammatory, anticancer, and antifibrotic properties^[3, 4].

In vitro, in a hemorrhagic stroke model using hemin-incubated cortical neuronal cells, Salvianolic acid A (30-60 μ M) improved cell viability, enhanced the expression of Solute Carrier Family 7 Member 11 (XCT) and glutathione peroxidase 4 (GPX4), and reduced reactive oxygen species (ROS) production^[5]. In hydrogen peroxide (H₂O₂)-induced human umbilical vein endothelial cell (HUVEC) injury models, Salvianolic acid A (0.25-16 μ M) treatment significantly increased cell viability and proliferation, reduced H₂O₂-induced cell death and oxidative stress, downregulated cell cycle-related proteins p53 and p21, and upregulated cyclin E1 levels^[6].

In vivo, In chloroform-induced liver fibrosis rats treated with Salvianolic acid A (5, 15 mg/kg/day) via intraperitoneal injection for 6 weeks, Salvianolic acid A alleviated hepatic inflammation and fibrosis, reduced collagen deposition and pseudolobule formation, and decreased serum levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT), hyaluronic acid (HA), laminin (LN), type IV collagen (CIV), and N-terminal propeptide of type III procollagen (PIIINP)^[7]. In gentamicin-induced acute kidney injury rats treated with Salvianolic acid A (10, 20, 40mg/kg/day) via intraperitoneal

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injection for 7 days, Salvianolic acid A reduced renal index, serum levels of kidney injury molecule-1 (KIM-1), and neutrophil gelatinase-associated lipocalin (NGAL), as well as urinary protein levels^[8].

References:

- [1] QIN T, RASUL A, SARFRAZ A, et al. Salvianolic acid A & B: potential cytotoxic polyphenols in battle against cancer via targeting multiple signaling pathways [J]. Int J Biol Sci, 2019, 15(10): 2256-2264.
- [2] QIU J M, QIN C F, WU S G, et al. A novel salvianolic acid A analog with resveratrol structure and its antioxidant activities in vitro and in vivo [J]. Drug Dev Res, 2021, 82(1): 108-114.
- [3] ZENG X, CHEN X, QIN H, et al. Preventive effects of a natural anti-inflammatory agent Salvianolic acid A on acute kidney injury in mice [J]. Food Chem Toxicol, 2020, 135(110901).
- [4] GONG D F, SUN S C, WANG R R, et al. Salvianolic acid A improve mitochondrial respiration and cardiac function via inhibiting apoptosis pathway through CRYAB in diabetic cardiomyopathy [J]. Biomed Pharmacother, 2023, 160(114382).
- [5] SHI Y, YAN D, NAN C, et al. Salvianolic acid A inhibits ferroptosis and protects against intracerebral hemorrhage [J]. Sci Rep, 2024, 14(1): 12427.
- [6] QIAO X, CAO S, CHEN S, et al. Salvianolic acid A alleviates H₂O₂-induced endothelial oxidative injury via miR-204-5p [J]. Sci Rep, 2024, 14(1): 11931.
- [7] WANG R, SONG F, LI S, et al. Salvianolic acid A attenuates CCl₄-induced liver fibrosis by regulating the PI3K/AKT/mTOR, Bcl-2/Bax and caspase-3/cleaved caspase-3 signaling pathways [J]. Drug Des Devel Ther, 2019, 13:1889-1900.
- [8] DIAO H Y, ZHU W, LIU J, et al. Salvianolic Acid A Improves Rat Kidney Injury by Regulating MAPKs and TGF-beta1/Smads Signaling Pathways [J]. Molecules, 2023, 28(8).

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