# Saikosaponin D

**Cat. No.:** HY-N0250

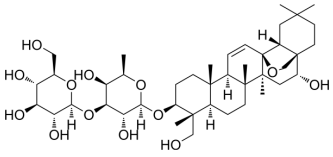
**CAS No.:** 20874-52-6

**Molecular Formula:** $C_{42}H_{68}O_{13}$

**Molecular Weight:** 780.98

**Target:** STAT; NF-κB; Estrogen Receptor/ERR; Bacterial

**Pathway:** JAK/STAT Signaling; Stem Cell/Wnt; NF-κB; Vitamin D Related/Nuclear Receptor; Anti-infection



**Storage:**

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| Powder | -20°C | 3 years |
| | 4°C | 2 years |
| In solvent | -80°C | 6 months |
| | -20°C | 1 month |

## SOLVENT & SOLUBILITY

**In Vitro**

DMSO : 50 mg/mL (64.02 mM; Need ultrasonic)

$H_2O$ : 1 mg/mL (1.28 mM; ultrasonic and warming and heat to 60°C)

| Preparing Stock Solutions | Solvent / Mass / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|---|
| | 1 mM | 1.2804 mL | 6.4022 mL | 12.8044 mL |
| | 5 mM | 0.2561 mL | 1.2804 mL | 2.5609 mL |
| | 10 mM | 0.1280 mL | 0.6402 mL | 1.2804 mL |

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

**In Vivo**

1. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (3.20 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (3.20 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

Saikosaponin D is a triterpene saponin isolated from Bupleurum, with anti-inflammatory, anti-bacterial, anti-tumor, and anti-allergic activities; Saikosaponin D inhibits selectin, STAT3 and NF-kB and activates estrogen receptor-β.

| $IC_{50}$ & Target | | | |
|---|---|---|---|
| | STAT3 | NF-κB | ERβ |

**In Vitro**

Saikosaponin D (Compound 3) is a triterpene saponin, which inhibits E-selectin, L-selectin and P-selectin binding to THP-1 cells, with $IC_{50}$s of 1.8 μM, 3.0 μM and 4.3 μM, and such effects are not due to cytotoxic action. Saikosaponin D (1, 5, 10 μM) dose-dependently inhibits the THP-1 adhesion to the HUVECs monolayer activated by TNF-α. Saikosaponin D (30 μM) also

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| | inhibits the expression of P-selectin ligand (CD162) in THP-1 cells[1]. Saikosaponin D (5 μM) suppresses the proliferation of HSC-T6 cells induced by $H_2O_2$ treatment, reduces the expression levels of α-SMA, TGF-β1, Hyp, COL1 and TIMP-1, and increases MMP-1 expressioon, thus inhibiting $H_2O_2$-induced excessive extracellular matrix (ECM) formation, with similar effects to estradiol (E2), and these effects are blocked by ER antagonists. Saikosaponin D also inhibits oxidative stress-induced ROS generation and down reduates MAPK signaling pathway, and the inhibition is also suppressed by ER antagonists[3].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **In Vivo** | Saikosaponin D (2 mg/kg/day, i.p.) shows a protective effect on overdose of acetaminophen (APAP)-induced liver injury of mice. Saikosaponin D affects APAP metabolism, increases GSH levels but does not alter PPARα activation. Saikosaponin D (2 mg/kg/day, i.p.) also suppresses APAP-induced increases in the expression of STAT3 target genes and pro-inflammatory cytokines and inhibits APAP-induced activation of STAT3 and NF-kB[2].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## PROTOCOL

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|---|---|
| **Cell Assay [1]** | Cell viability is assessed by morphology and by reduction of the tetrazolium salt (MTT). Briefly, the THP-1 cells ($2 \times 10^5$ cells/well) and various concentrations of compounds 1-4 (including Saikosaponin D) are added to the 96-well plates, incubated for 48 h at 37°C, and 5 μL of MTT solution (5 mg/mL in PBS) is added to each well of the 96-well plates. After incubation for 4 h at 37°C, the absorbance is measured at 540 nm using a microplate reader with the reference absorbance at 650 nm[1].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **Animal Administration [2]** | Mice[2]<br>Male 6- to 7-week-old C57BL6 mice are randomly divided into four groups, vehicle/control, Saikosaponin D (SSd)/control, vehicle/APAP, and SSd/APAP, and killed 4 h or 24 h after single APAP injection. For overdose of acetaminophen (APAP) injection, a typical single dose of 200 mg/kg/day is used. Saikosaponin D, 2 mg/kg once daily is used as the dosing regimen. Saikosaponin D powder is dissolved in a saline solution supplemented with 0.1% Tween 20 and is administered by intraperitoneal injection at a dose of 2 mg/kg/day once daily for five days. Saline solution containing 0.1% Tween 20 without Saikosaponin D is administered as a vehicle. APAP is dissolved in warm saline solution (20 mg/mL) and is injected intraperitoneally 30 minutes after the last Saikosaponin D injection. Saline is injected to mice in the control groups[2].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |



## CUSTOMER VALIDATION

- Drug Des Devel Ther. 2021 Nov 23;15:4741-4757.
- Evid-Based Compl Alt. 19 Aug 2021.

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## REFERENCES

[1]. Jang MJ, et al. Saikosaponin D isolated from Bupleurum falcatum inhibits selectin-mediated cell adhesion. Molecules. 2014 Dec 4;19(12):20340-9.

[2]. Liu A, et al. Saikosaponin d protects against acetaminophen-induced hepatotoxicity by inhibiting NF-κB and STAT3 signaling. Chem Biol Interact. 2014 Nov 5;223:80-6.

[3]. Que R, et al. Estrogen receptor-β-dependent effects of saikosaponin d on the suppression of oxidative stress-induced rat hepatic stellate cell activation. Int J Mol Med. 2018 Mar;41(3):1357-1364.