

## Product Data Sheet

Product Name: Calycosin

Cat. No.: GN10667

### Chemical Properties

Cas. No. 20575-57-9

Chemical Name 7-hydroxy-3-(3-hydroxy-4-methoxyphenyl)chromen-4-one

SMILES COC1=CC(=C(C=C1)C2=COC3=C(C2=O)C=CC(=C3)O)O

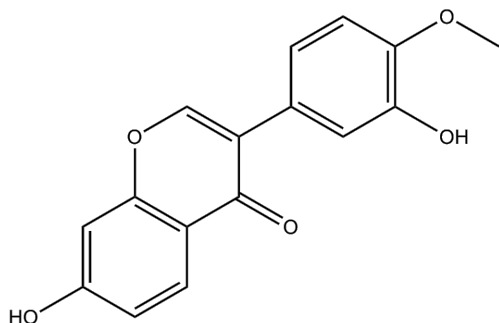
Formula  $C_{16}H_{12}O_5$  M.Wt 284.26

Solubility DMSO :  $\geq 100$  mg/mL (351.79 mM) Storage Store at 2-8°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.

Structure



### Protocol

#### Cell experiment [1]:

Cell lines AGS cells

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

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AGS cells were cultured in RPMI-1640 medium supplemented with 10% fetal bovine serum, 100U/ml penicillin, and 100µg/ml streptomycin at 37°C with 5% CO<sub>2</sub> and 95% saturated atmospheric humidity. Cells were seeded into 96-well microplates at a density of  $1 \times 10^4$  cells/ml for 24h. Various concentrations of Calycosin (0, 1, 10, 20, 40, 60, 80, and 100µM) were added to each well. After 24h of incubation, cell viability was analyzed.

### Preparation Method

Reaction Conditions 0, 1, 10, 20, 40, 60, 80, and 100µM; 24h

Applications Calycosin treatment significantly reduced the cell viability of AGS cells in a dose-dependent manner.

### Animal experiment [2]:

Animal models Male Balb/c mice

Male Balb/c mice (6 weeks old; 18-20g) were housed under standard laboratory conditions on a 12-hour light/dark cycle (lights on at 7:00 am), constant temperature (23±2°C), and constant humidity (60±5), ad libitum food and water.

Preparation Method Mice were treated with 2.5% DSS aqueous solution for 7 days and kept on water for an additional 4 days to exhibit colitis. Mice were orally administered Calycosin at a dose of 50mg/kg daily for 10 days, after which the colon tissues were collected for analysis.

Dosage form 50mg/kg/day; 10 days; p.o.

Applications Calycosin treatment reduced colonic mucosal damage and colonic shortening in mice with colitis.

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### References:

- [1] Zhang Y, Zhang J Q, Zhang T, et al. Calycosin induces gastric cancer cell apoptosis via the ROS-mediated MAPK/STAT3/NF- $\kappa$ B pathway[J]. *OncoTargets and therapy*, 2021: 2505-2517.
- [2] Chao L, Zheng P, Xia L, et al. Calycosin attenuates dextran sulfate sodium (DSS)-induced experimental colitis[J]. *Iranian Journal of Basic Medical Sciences*, 2017, 20(9): 1056.

### Background

Calycosin, a naturally occurring isoflavonoid found predominantly in *Astragalus membranaceus*, has antioxidant, anti-inflammatory, and anti-apoptotic properties<sup>[1]</sup>. By inhibiting the activation of NF- $\kappa$ B, Calycosin can reduce the production of pro-inflammatory cytokines (TNF- $\alpha$ , IL-1 $\beta$ , and IL-6), and alleviate the inflammatory response<sup>[2]</sup>. Calycosin has been widely used to stabilize membrane structures, improve membrane integrity, and alleviate cellular oxidative damage<sup>[3]</sup>.

In vitro, Calycosin treatment for 24 hours significantly inhibited the viability of AGS, KATO-3, and MKN-28 cells, with IC<sub>50</sub> values of 47.18 $\mu$ M, 82.17 $\mu$ M and 71.93 $\mu$ M, respectively<sup>[4]</sup>. Treatment with 80 $\mu$ M Calycosin for 48 hours significantly induced apoptosis in HT29 cells, accompanied by a decrease in the protein level of LC3I and an increase in the protein levels of LC3II and Beclin-1<sup>[5]</sup>. Treatment with 100 $\mu$ M Calycosin for 24 hours significantly inhibited the IGF-1R signaling pathway in MDA-435 cells and reduced cell viability<sup>[6]</sup>.

In vivo, Calycosin treatment via oral administration at a dose of 50mg/kg daily for 10 days significantly alleviated the intestinal damage in mice induced by dextran sulfate sodium (DSS) and prevented the weight loss of the mice<sup>[7]</sup>. Oral administration of Calycosin at a dose of 50mg/kg/day for 3 days significantly alleviated myocardial fibrosis and cardiac dysfunction following myocardial infarction in mice<sup>[8]</sup>.

### References:

- [1] Ahmed H S. Neuropharmacological effects of calycosin: a translational review of molecular mechanisms and therapeutic applications[J]. *Naunyn-Schmiedeberg's Archives of Pharmacology*, 2025, 398(10): 12891-12909.
- [2] Gong G, Zheng Y, Yang Y, et al. Pharmaceutical values of calycosin: one type of flavonoid

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isolated from astragalus[J]. Evidence-Based Complementary and Alternative Medicine, 2021, 2021(1): 9952578.

[3] Gao J Q, Liu Z J, Chen T, et al. Pharmaceutical properties of calycosin, the major bioactive isoflavonoid in the dry root extract of Radix astragali[J]. Pharmaceutical biology, 2014, 52(9): 1217-1222.

[4] Zhang Y, Zhang J Q, Zhang T, et al. Calycosin induces gastric cancer cell apoptosis via the ROS-mediated MAPK/STAT3/NF- $\kappa$ B pathway[J]. OncoTargets and therapy, 2021: 2505-2517.

[5] El-kott A F, Al-kahtani M A, Shati A A. Calycosin induces apoptosis in adenocarcinoma HT 29 cells by inducing cytotoxic autophagy mediated by SIRT 1/AMPK-induced inhibition of Akt/mTOR[J]. Clinical and Experimental Pharmacology and Physiology, 2019, 46(10): 944-954.

[6] Chen J, Hou R, Zhang X, et al. Calycosin suppresses breast cancer cell growth via ER $\beta$ -dependent regulation of IGF-1R, p38 MAPK and PI3K/Akt pathways[J]. PloS one, 2014, 9(3): e91245.

[7] Chao L, Zheng P, Xia L, et al. Calycosin attenuates dextran sulfate sodium (DSS)-induced experimental colitis[J]. Iranian Journal of Basic Medical Sciences, 2017, 20(9): 1056.

[8] Chen G, Xu H, Xu T, et al. Calycosin reduces myocardial fibrosis and improves cardiac function in post-myocardial infarction mice by suppressing TGFBR1 signaling pathways[J]. Phytomedicine, 2022, 104: 154277.

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