

Product Data Sheet

Product Name: Astragaloside A

Cat. No.: GC18109

Chemical Properties

Cas. No. 83207-58-3

Chemical Name (2R,3R,4S,5S,6R)-2-(((2aR,3R,4S,5aS,5bS,7S,7aR,9S,11aR,12aS)-4-hydroxy-3-((2R,5S)-5-(2-hydroxypropan-2-yl)-2-methyltetrahydrofuran-2-yl)-2a,5a,8,8-tetramethyl-9-(((2S,3R,4S,5R)-3,4,5-trihydroxytetrahydro-2H-pyran-2-yl)oxy)hexadecahydrocyclopenta[a]cyclopr

SMILES CC1([C@](O[C@@]2([H])[C@@](O)([H])[C@](O)([H])[C@@](O)([H])CO2)([H])CC[C@]34C[C@@]([C@@]5([H])C[C@@](O[C@@]6([H])[C@@](O)([H])[C@](O)([H])[C@@](O)([H])[C@@](O6)([H])CO)([H])[C@@]14[H])3CC[C@@]7([C@]([C@]8(CC[C@@](O8)([H])C(C)(O)C)C)([H])[C@](O)([H])C[C@@]

Formula C₄₁H₆₈O₁₄ M.Wt 784.97

Solubility DMF: 20 mg/ml, DMSO: 30 mg/ml, DMSO: PBS(pH7.2) (1:1): 0.5 mg/ml
 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.

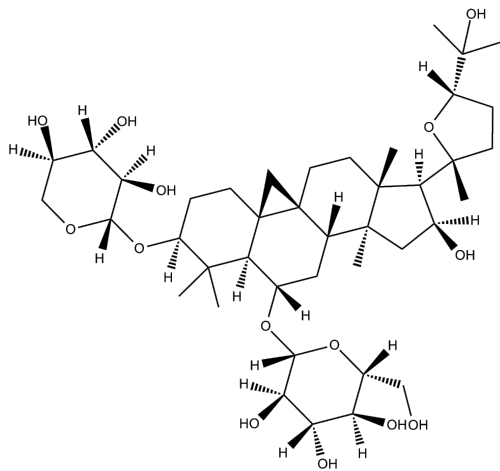
Caution: Product has not been fully validated for medical applications. For research use only.

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Structure



Protocol

Cell experiment [1]:

Cell lines The human monocyte cell line THP-1

Preparation Method

The THP-1 cells were differentiated into M0 macrophages, M1-polarized macrophages and M2-polarized macrophages. Macrophages were treated with Astragaloside A at 0, 40, 60, 80 and 100 μ M for 48 hours respectively. After exposure to various concentrations of Astragaloside A, the viability of cells was determined using the MTT assay system. The cells were plated on 96-well culture plates at a density of 1 $\times$ 10⁶ cells/ml. After the specific time frame, added 10 μ L MTT reagent to each well and then cultured the cells for 4h. Afterwards, 100 μ L formazan solution was added to each well. The 96-well culture plate was agitated for 10 min on a shaker. Finally, the OD value of each well was detected at 490nm.

Reaction Conditions

0, 40, 60, 80 and 100 μ M astragaloside A for 48 hours

Applications

Astragaloside A did not cause significant cell death in the concentration range of 40 μ M to 100 μ M.

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Animal experiment [2]:

Animal models Male C57BL/6J mice

Preparation Method Male C57BL/6J mice were randomly divided: NS group (normal saline), Ast group (astragaloside A 100mg/kg), PM2.5 group, Ast-L group (astragaloside A 50mg/kg + PM2.5), Ast-H group (astragaloside A 100mg/kg + PM2.5). Mice were pre-treated with astragaloside A intraperitoneally for three days. Then, PM2.5 (7.5mg/kg) was given by non-invasive tracheal instillation to induce lung injury.

Dosage form 100mg/kg, 50mg/kg, Intraperitoneal Injections, 3d

Applications Astragaloside A reduced the lung wet-dry ratio and the levels of interleukin 6 (IL-6), tumor necrosis factor- α (TNF- α) and interleukin 1 β (IL-1 β) in serum. Astragaloside A could also improve the oxidative stress level in bronchoalveolar lavage fluid, restore the GSH level in the lung tissue, and reduce the iron content in the lung tissue.

References:

- [1] Zhang L, Liu Q, Lu L, et al. Astragaloside A stimulates angiogenesis and increases hypoxia-inducible factor-1 α accumulation via phosphatidylinositol 3-kinase/Akt pathway[J]. Journal of Pharmacology and Experimental Therapeutics, 2011, 338(2): 485-491.
- [2] Xu F, Cui W Q, Wei Y, et al. Correction: Astragaloside A inhibits lung cancer progression and metastasis by modulating macrophage polarization through AMPK signaling[J]. Journal of Experimental & Clinical Cancer Research, 2023, 42(1): 70.

Background

Astragaloside A is an active saponin compound extracted from Astragalus membranaceus with antioxidant, cardioprotective, anti-inflammatory, antiviral, antibacterial, antifibrosis, antidiabetic and immunomodulatory pharmacological effects. Therefore, it has protective effects against cerebral

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injury and central nervous system, cardiovascular diseases, respiratory system, kidney, endocrine system, organic immune system, liver and cancer^[1].

Astragaloside A decreased the LPS induced expression of E-selectin and VCAM-1 on the surface of HUVECs in a dose dependent manner (1, 10, 50, 100µg/ml). Moreover, Astragaloside A (100µg/ml) completely inhibited LPS-induced nuclear translocation of NF-κB and NF-κB DNA binding activity in endothelial cells, thereby enhancing anti-inflammatory capacity by decreasing the adhesion-promoting activity of LPS-stimulated HUVECs to polymorpho-nuclear leukocytes (PMNs) and the monocyte lineage THP-1^[2].

Astragaloside A (10mL/kg/d by oral gavage for 8 weeks) improved the general status of aging rats induced by D-galactose. In addition, Astragaloside A attenuated the inflammatory response by decreasing the expression of hippocampal IL-1β, TNF-α, and IL-6, and prevented D-galactose-induced AGEs, RAGEs, and NF-κB expression in the hippocampus, which resulted in the improvement of the memory function, the impairment of the organ indexes, and the pathological damage of the hippocampus^[3].

References:

- [1] Zhang J, Wu C, Gao L, et al. Astragaloside A derived from Astragalus membranaceus: A research review on the pharmacological effects[J]. Advances in Pharmacology, 2020, 87: 89-112.
- [2] Zhang W J, Hufnagl P, Binder B R, et al. Antiinflammatory activity of astragaloside A is mediated by inhibition of NF-κB activation and adhesion molecule expression[J]. Thrombosis and haemostasis, 2003, 90(11): 904-914.
- [3] Li W, Wang S, Wang H, et al. Astragaloside A prevents memory impairment in D-galactose-induced aging rats via the AGEs/RAGE/NF-κB axis[J]. Archives of medical research, 2022, 53(1): 20-28.

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