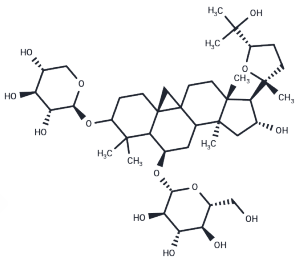
Data Sheet (Cat.No.T2973)

TargetMol

Astragaloside IV

Chemical Properties



CAS No. : 84687-43-4

Formula: C41H68O14

Molecular Weight: 784.97

Appearance: no data available

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Biological Description

Description	Astragaloside IV (AS-IV), an active component isolated from Astragalus membranaceus, suppresses the activation of ERK1/2 and JNK, and downregulates matrix metalloproteases (MMP)-2, (MMP)-9 in MDA-MB-231 breast cancer cells. Astragaloside IV is a bioactive saponin first isolated from the dried plant roots of the genus Astragalus, which is used in traditional Chinese medicine.1 It dose-dependently inhibits human adenovirus type 3 (HAdV-3) in A549 cells (IC50 = 23 μM; LC50 = 865 μM).It inhibits replication of HAdV-3 and decreases HAdV-3-induced apoptosis. It has diverse protective effects for the cardiovascular, immune, digestive, and nervous systems. In particular, it reduces myocardial infarct size in dogs when administered prior to coronary ligation and reduces reperfusion arrhythmias in isolated rat hearts.
Targets(IC50)	MMP,ERK,Estrogen/progestogen Receptor,JNK
In vitro	Astragaloside IV reduces the viability and invasiveness of MDA-MB-231 breast cancer cells by impeding the activation of mitogen-activated protein kinase (MAPK) family members ERK1/2 and JNK and lowers the expression of matrix metalloproteases (MMP) -2 and -9. At concentrations of 10, 20, and 40 ng/mL, it hampers the growth of NSCLC cells, while lower doses (1, 2.5, 5 ng/mL) exhibit negligible cytotoxic effects. Additionally, when used alongside cisplatin, astragaloside IV notably enhances the chemosensitivity of NSCLC cells. This synergistic effect is further evidenced by the significant reduction in mRNA and protein levels of B7-H3 during combined treatment with astragaloside IV and cisplatin.
In vivo	In a mice model, astragaloside IV administration at high doses significantly improved 48-hour survival rates (60% vs 13.3%, $P < 0.05$), markedly decreased serum levels of ALT and AST ($P < 0.01$), and substantially mitigated liver histopathological indices and hepatocyte apoptosis ($P < 0.01$). Furthermore, it significantly reduced MDA content in liver homogenates ($P < 0.01$) while enhancing SOD activity. Oral doses of astragaloside IV (10, 20 mg/kg) notably prevented cognitive deficits following transient cerebral ischemia and reperfusion. Both doses effectively reduced cytokine levels when compared to the Model group. Additionally, astragaloside IV markedly suppressed TLR4 levels and its downstream proteins, underlining the significance of the MyD88-dependent and -independent pathways in its anti-inflammatory action. It also decreased the expression of NLRP3 and cleaved-caspase-1, alongside reducing Iba1 protein expression, further evidencing its therapeutic potential in inflammation-related pathologies.

Kinase Assay	MDA-MB-231 cells treated as indicated or tumor tissues are harvested and lysed in Mg2+ lysis buffer containing 50 mM Tris (pH 7.5), 10 mM MgCl2, 0.5 M NaCl, and protease inhibitor cocktail. Equal amounts of lysates are incubated with PAK-PBD beads at 4°C for 1 h. PAK-PBD beads are pelleted by centrifugation and washed with ish buffer containing 25 mM Tris (pH 7.5), 30 mM MgCl2, 40 mM NaCl. Active Rac1 is detected by western blotting.
Cell Research	CCK-8 assay is adopted to determine cell viability. cultured NSCLC cells are seeded into 96-well plates at the density of 4×104 (cells/well). Then 10 μL?well CCK8 solution is added and incubated in dark at 37°C for another 2 h. The absorbance is determined with the wavelength of 490 nm.
Animal Research	Transient cerebral ischemia and reperfusion is prepared by BCCAO. Mice are randomly divided into the Sham, Model, Astragaloside IV (10 mg/kg) and Astragaloside IV (20 mg/kg) treatment groups. The Astragaloside IV treatment groups are intragastrically administered 7 days before the surgery and terminated on the day of sacrifice. On the day of the surgery, Astragaloside IV is administrated 2 h prior to ischemia. The Sham-operated and Model groups are treated with distilled water. After the mice are anesthetized with an intraperitoneal injection of chloral hydrate (350 mg/kg), the bilateral common carotid arteries are exposed and carefully separated with a small ventral neck incision and occluded twice (20 min each) with ligated surgical silk as described previously with minor modifications. There is a 10 min reperfusion period between the two occlusion periods (ischemia 20 min ? reperfusion 10 min ? ischemia 20 min). Sham-operated mice are subjected to the same surgical operation without the surgical silk ligation. Mouse body temperature is maintained at 37±0.5°C during the surgery with heating equipment until recovery from the anesthesia.

Solubility Information

Solubility	DMSO: 50 mg/mL (63.7 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.2739 mL	6.3697 mL	12.7393 mL
5 mM	0.2548 mL	1.2739 mL	2.5479 mL
10 mM	0.1274 mL	0.637 mL	1.2739 mL
50 mM	0.0255 mL	0.1274 mL	0.2548 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Reference

Li M, et al. Astragaloside IV attenuates cognitive impairments induced by transient cerebral ischemia and reperfusion in mice via anti-inflammatory mechanisms. Neurosci Lett. 2016 Dec 20. pii: S0304-3940(16)3201994-6
Chen X, Tian C, Zhang Z, et al.Astragaloside IV Inhibits NLRP3 Inflammasome-Mediated Pyroptosis via Activation of Nrf-2/HO-1 Signaling Pathway and Protects against Doxorubicin-Induced Cardiac Dysfunction.Frontiers in Bioscience-Landmark.2023, 28(3): 45.
Zhang X, Yan W, Chen X, et al.Long-term 4-nonylphenol Exposure Drives Cervical Cell Malignancy Through MAPK-mediated Ferroptosis Inhibition.Journal of Hazardous Materials.2024: 134371.
He CS, et al. Astragaloside IV Enhances Cisplatin Chemosensitivity in Non-Small Cell Lung Cancer Cells Through Inhibition of B7-H3. Cell Physiol Biochem. 2016;40(5):1221-1229. Epub 2016 Dec 14.
Liu L, et al. [Protective effect of astragaloside IV against acute liver failure in experimental mice]. Zhonghua Gan Zang Bing Za Zhi. 2016 Oct 20;24(10):772-777.
Jiang K, et al. Astragaloside IV inhibits breast cancer cell invasion by suppressing Vav3 mediated Rac1/MAPK signaling. Int Immunopharmacol. 2016 Dec 5;42:195-202