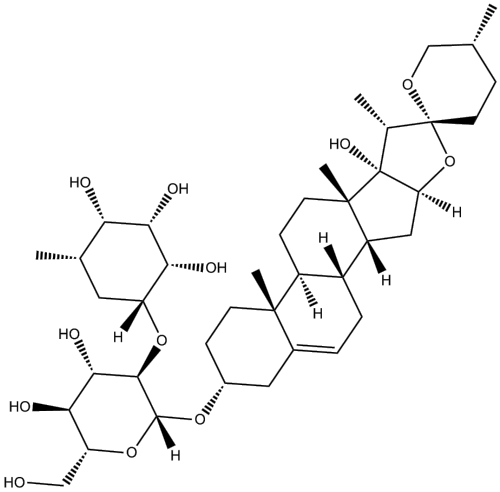
Product Data Sheet

Product Name: Polyphyllin VI
Cat. No.: GN10249

Chemical Properties

Cas. No.	55916-51-3		
Chemical Name	Chonglou saponin VI		
SMILES	O[C@@H]([C@@H](O)[C@H]1O)[C@]([H])(O[C@H]2[C@@](O[C@H]3CC4=CC[C@]([C@](C[C@@](O[C@]5(OC6)CC[C@H]6C)([H])[C@]7(O)[C@@H]5C)([H])[C@@]7(CC8)C)([H])[C@@]8([H])[C@]4(CC3)C)([H])O[C@H](CO)[C@@H](O)[C@@H]2O)C[C@@H]1C		
Formula	$C_{39}H_{62}O_{13}$	M.Wt	738.91
Solubility	≥ 73.9mg/mL in EtOH with gentle warming	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.		

Structure



Protocol

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Cell experiment [1]:

Cell lines	Glioma Cell lines U87, LN229, U251, and U343
Preparation Method	Glioma Cell lines U87, LN229, U251, and U343 were cultured in DMEM medium supplemented with 10% FBS and maintained in an incubator at 37°C, and 5% CO2. Approximately 2000 glioma cells were re-suspended in 100μL of complete medium and cultured in 6-well plates for 24 hrs. The cells were treated with varying concentrations of Polyphyllin VI (0, 2, 4, 6, and 8μM) followed by a 12, 24 and 48 hrs incubation. Thereafter, the cells were treated with the WST-8 reagent from CCK-8 for 2 hrs, then their viability assayed by detecting the absorbance at OD 450nm. Cell apoptosis was analyzed using the Annexin V-FITC Kit. Cell cycle distribution was detected by flow cytometry. Transwell assay was carried out to determine the role of Polyphyllin VI on the invasive ability of glioma cells.
Reaction Conditions	0-8μM; 12-48h
Applications	Polyphyllin VI (0-8μM; 12-48h) dose-dependently inhibits cell proliferation, suppresses migration, and induces apoptosis in glioma cells.

Animal experiment [2]:

Animal models	C57BL/6 mice

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Preparation Method	C57BL/6 mice were first anesthetized with 5mg/mL pentobarbital sodium. Then, 100μL of normal saline containing BLM sulfate(2mg/kg) was directly injected into the trachea of C57BL/6J mice. For the therapeutic experiment, the mice were randomly categorized into two groups on the seventh day following BLM modeling: the BLM+solvent (dimethyl sulfoxide: polyethylene glycol 400: normal saline=5:45:50) group and the BLM+Polyphyllin VI (5mg/kg/day) group. All mice were injected intraperitoneally with PPVI for 14 days, during which the mice's weight was measured every 3 days. Then the mice were sacrificed for tissue sample collection, and the weight of the lungs was recorded. Histopathological and immunohistochemical (IHC) tests were conducted on a lung excised from the left and soaked in 4% paraformaldehyde.
Dosage form	5mg/kg/day; i.p.; 14 days
Applications	Polyphyllin VI reversed bleomycin-induced pulmonary fibrosis in C57BL/6J mice, reduced collagen deposition, suppressed α-SMA and vimentin expression, and restored E-cadherin levels.

References:

[1] Liu W, Chai Y, Hu L, et al. Polyphyllin VI Induces Apoptosis and Autophagy via Reactive Oxygen Species Mediated JNK and P38 Activation in Glioma. *Onco Targets Ther*. 2020;13:2275-2288.
[2] Xie Y, Gan C, Liu H, et al. Polyphyllin VI Ameliorates Pulmonary Fibrosis by Suppressing the MAPK/ERK and PI3K/AKT Signaling Pathways via Upregulating DUSP6. *Phytother Res*. 2024;38(12):5930-5948.

Background

Polyphyllin VI is an orally active natural saponin that exerts anticancer effects primarily by inducing cell-cycle arrest, apoptosis, and pyroptosis[1][2]. Polyphyllin VI is commonly used in cancer-mechanism studies, especially those focused on cell-death pathways and their associated signaling

cascades[3].

In vitro, treatment of glioma cells with Polyphyllin VI (0-8μM; 12-48h) dose-dependently inhibits cell proliferation, blocks cycle at G2/M, suppresses migration, and induces apoptosis and autophagy[4]. Polyphyllin VI (0-30μM; 48h) inhibits U2OS osteosarcoma proliferation, triggers G2/M arrest, collapses mitochondrial membrane potential, and simultaneously evokes caspase-mediated apoptosis[5].

In vivo, Polyphyllin VI (5mg/kg/day; i.p.; 14 days) reversed bleomycin-induced pulmonary fibrosis in C57BL/6J mice, reduced collagen deposition, suppressed α-SMA and vimentin expression, and restored E-cadherin levels[6]. Polyphyllin VI (10mg/kg/day; i.p.; 10 days) increased NLRP3 inflammasome activation and caspase-1-mediated pyroptosis in A549 tumor xenografts of athymic nude mice[7].

References:
[1] Lin Z, Liu Y, Li F, et al. Anti-lung Cancer Effects of Polyphyllin VI and VII Potentially Correlate with Apoptosis In Vitro and In Vivo. *Phytother Res*. 2015;29(10):1568-1576.
[2] Liu Y, Dong X, Wang W, et al. Molecular Mechanisms of Apoptosis in HepaRG Cell Line Induced by Polyphyllin VI via the Fas Death Pathway and Mitochondrial-Dependent Pathway. *Toxins (Basel)*. 2018;10(5):201.
[3] Wang Y, Huang X, Xian B, et al. Machine learning and bioinformatics-based insights into the potential targets of saponins in *Paris polyphylla* smith against non-small cell lung cancer. *Front Genet*. 2022;13:1005896.
[4] Liu W, Chai Y, Hu L, et al. Polyphyllin VI Induces Apoptosis and Autophagy via Reactive Oxygen Species Mediated JNK and P38 Activation in Glioma. *Onco Targets Ther*. 2020;13:2275-2288.
[5] Yuan YL, Jiang N, Li ZY, et al. Polyphyllin VI induces apoptosis and autophagy in human osteosarcoma cells by modulation of ROS/JNK activation. *Drug Des Devel Ther*. 2019;13:3091-3103.
[6] Xie Y, Gan C, Liu H, et al. Polyphyllin VI Ameliorates Pulmonary Fibrosis by Suppressing the MAPK/ERK and PI3K/AKT Signaling Pathways via Upregulating DUSP6. *Phytother Res*. 2024;38(12):5930-5948.
[7] Teng JF, Mei QB, Zhou XG, et al. Polyphyllin VI Induces Caspase-1-Mediated Pyroptosis via the Induction of ROS/NF-κB/NLRP3/GSDMD Signal Axis in Non-Small Cell Lung Cancer. *Cancers (Basel)*. 2020;12(1):193.

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