

Product Data Sheet

Product Name: Gastrodin

Cat. No.: GN10277

Chemical Properties

Cas. No. 62499-27-8

Chemical Name (2R,3S,4S,5R,6S)-2-(hydroxymethyl)-6-[4-(hydroxymethyl)phenoxy]oxane-3,4,5-triol

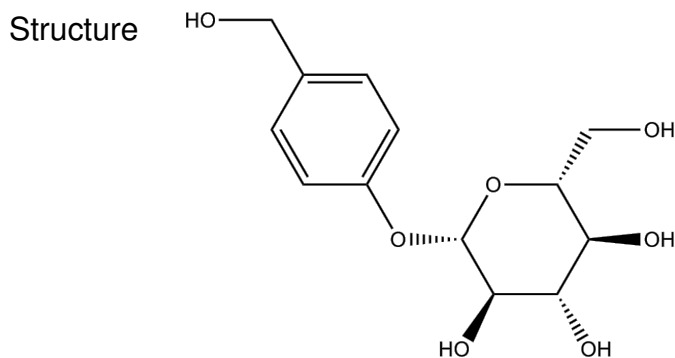
SMILES C1=CC(=CC=C1CO)OC2C(C(C(C(O2)CO)O)O)O

Formula $C_{13}H_{18}O_7$ M.Wt 286.28

Solubility Water : 100 mg/mL (349.31 mM); DMSO : >50 mg/mL (174.65 mM) 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.



Protocol

Cell experiment [1]:

Cell lines Mouse microglial cell line BV-2 cells

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Cells were cultured in Dulbecco's modified Eagle's medium containing 2% fetal bovine serum and antibiotics (100IU/ml penicillin and 100µg/ml streptomycin) and maintained at 37°C in a humidified incubator with 5% CO₂. Cells

(approximately 1×10^6 cells/ml) were seeded in six-well plates before being subjected to treatments. Five groups of BV-2 cells were subjected to various treatments. In group 1, the cells were incubated in serum-free DMEM. In group 2, the cells were treated with 1µg/ml lipopolysaccharide (LPS). In groups 3, 4, and 5, the cells were treated with 30µM, 40µM, and 60µM Gastrodin for 1h and then stimulated with LPS (1µg/ml). After incubation of the cells for 30min to 4h, reverse transcription polymerase chain reaction (RT-PCR) and protein blotting analysis were performed.

Reaction Conditions
30, 40 and 60µM; 1h

Applications
Gastrodin pretreatment significantly inhibited the protein and mRNA expression levels of iNOS, COX-2, TNF-α, IL-1β and NF-κB in microglial cells stimulated by LPS.

Animal experiment [2]:

Animal models SD rats (acute ocular hypertension (AOH) model)

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

All the operations were performed under general anesthesia with intraperitoneal injection of chloral hydrate (400mg/kg) and additional topical anesthesia (0.5% proparacaine hydrochloride eye drops). The anterior chamber of a randomly chosen eye was cannulated with a 30-Gauge infusion needle connected with a 500mL saline-filled bottle. By keeping the bottle to a height of 1500mm above the eye, the Intraocular pressure (IOP) could rise to 110mm Hg. The IOP was monitored using a Tono-Pen and continuously maintained for 60min. The rats with only anterior chamber penetration and without IOP elevation were served as the control group. After 60min, the needle was removed from the anterior chamber and the rats were intraperitoneally injected with Gastrodin at 10mg/kg (G10 group), 50mg/kg (G50 group) and 0.9% NS (NS group), respectively, once a day for the next 2wk. The loss of RGCs and the number of Iba1-positive retina microglia were determined at 2wk after rapid ocular hypertension.

Dosage form 10, 50mg/kg/day; 2 weeks; i.p.

Applications Gastrodin treatment dose-dependently significantly inhibited the loss of retinal ganglion cells (RGCs) in AOH rats, and reduced the number of Iba1-positive microglia in the retina.

References:

- [1] Dai JN, Zong Y, Zhong LM, Li YM, Zhang W, Bian LG, Ai QL, Liu YD, Sun J, Lu D. Gastrodin inhibits expression of inducible NO synthase, cyclooxygenase-2 and proinflammatory cytokines in cultured LPS-stimulated microglia via MAPK pathways. PLoS One. 2011;6(7):e21891.
- [2] Wang JW, Liu YM, Zhao XF, Zhang H. Gastrodin protects retinal ganglion cells through inhibiting microglial-mediated neuroinflammation in an acute ocular hypertension model. Int J Ophthalmol. 2017 Oct 18;10(10):1483-1489.

Background

Gastrodin is a phenolic glucoside and the main active component of the Chinese herb Tianma and it has sedative, hypnotic and anticonvulsant effects [1]. Gastrodin can penetrate the blood-brain barrier and restore the imbalance between excitation and inhibition processes in the cerebral cortex,

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

showing good antihypertensive, sedative and hypnotic effects, and having certain therapeutic effects on neurasthenia, insomnia and headache. It can also dilate blood vessels, improve microcirculation of the myocardium, relieve cerebral vasospasm, increase myocardial nutritional blood flow and enhance oxygen supply capacity. Gastrodin also has anti-inflammatory and anti-obesity effects [2]. Gastrodin can be used in the research of treatment for dizziness, epilepsy, stroke and dementia [3].

In vitro, Gastrodin (30, 40 and 60 μ M; 1h) pretreatment significantly inhibited the protein and mRNA expression levels of iNOS, COX-2, TNF- α , IL-1 β and NF- κ B in lipopolysaccharide (LPS)-stimulated microglia, and weakened the phosphorylation of extracellular signal-regulated kinase 1/2 (ERK1/2), c-Jun N-terminal kinase (JNK) and p38 mitogen-activated protein kinase (p38MAPK) [4]. Gastrodin (5, 10 and 20 μ M; 1h) pretreatment significantly upregulated the (PI3-K)/Akt signaling pathway in LPS-induced H9c2 cardiomyocytes in a dose-dependent manner, while inhibiting the activation of NF- κ B and MAPKs [5].

In vivo, Gastrodin (10, 50mg/kg/day; 2 weeks; i.p.) treatment significantly inhibited the loss of retinal ganglion cells (RGCs) in acute ocular hypertension (AOH) rats and reduced the number of Iba1-positive microglia in the retina [6]. Gastrodin (10, 20mg/kg/day; 28 days;) can improve the depressive-like behavior of depressed mice through oral administration, increase neurotransmitter levels, improve nerve cell damage, and inhibit the expression of Caspase-3 [7].

References:

- [1] Liu Y, Gao J, Peng M, et al. A review on central nervous system effects of gastrodin[J]. Frontiers in pharmacology, 2018, 9: 24.
- [2] Dai Y, Ban W, Yang Z. Gastrodin, a promising natural small molecule for the treatment of central nervous system disorders, and its recent progress in synthesis, pharmacology and pharmacokinetics[J]. International journal of molecular sciences, 2024, 25(17): 9540.
- [3] Yang C S, Chiu S C, Liu P Y, et al. Gastrodin alleviates seizure severity and neuronal excitotoxicities in the rat lithium-pilocarpine model of temporal lobe epilepsy via enhancing GABAergic transmission[J]. Journal of ethnopharmacology, 2021, 269: 113751.
- [4] Dai JN, Zong Y, Zhong LM, Li YM, Zhang W, Bian LG, Ai QL, Liu YD, Sun J, Lu D. Gastrodin inhibits expression of inducible NO synthase, cyclooxygenase-2 and proinflammatory cytokines in cultured LPS-stimulated microglia via MAPK pathways. PLoS One. 2011;6(7):e21891.
- [5] Yang P, Han Y, Gui L, Sun J, Chen YL, Song R, Guo JZ, Xie YN, Lu D, Sun L. Gastrodin attenuation of the inflammatory response in H9c2 cardiomyocytes involves inhibition of NF- κ B and

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

MAPKs activation via the phosphatidylinositol 3-kinase signaling. Biochem Pharmacol. 2013 Apr 15;85(8):1124-33.

[6] Wang JW, Liu YM, Zhao XF, Zhang H. Gastrodin protects retinal ganglion cells through inhibiting microglial-mediated neuroinflammation in an acute ocular hypertension model. Int J Ophthalmol. 2017 Oct 18;10(10):1483-1489.

[7] Pei H, Shen H, Bi J, et al. Gastrodin improves nerve cell injury and behaviors of depressed mice through Caspase-3-mediated apoptosis[J]. CNS Neuroscience & Therapeutics, 2024, 30(3): e14444.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA