

Product Data Sheet

Product Name: Myrtillin
Cat. No.: GC44263

Chemical Properties

Cas. No. 6906-38-3

SMILES OC(C=C1O)=CC2=C1C=C(O[C@H]3[C@H](O)[C@@H](O)[C@H](O)[C@@H](CO)O3)C(C4=CC(O)=C(O)C(O)=C4)=[O+]2.[Cl-]

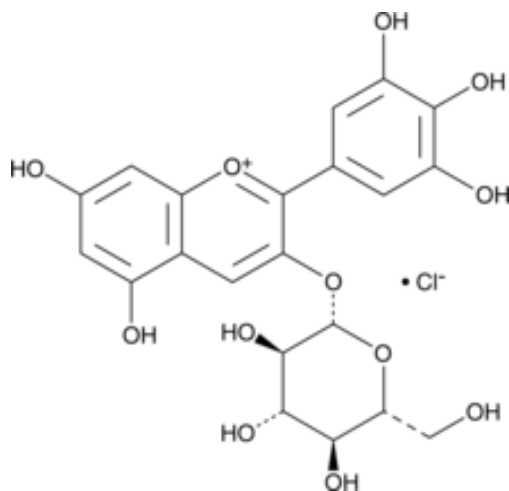
Formula $C_{21}H_{21}O_{12} \cdot Cl$ M.Wt 500.8

Solubility DMF: 1.5 mg/ml, DMSO: 10 mg/ml, PBS (pH 7.2): 0.2 mg/ml Storage Store at -20°C, sealed storage, away from moisture and light

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	HT-29 cells
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Preparation Method	HT-29 cells were cultured in RPMI-1640 medium, supplemented with 10% fetal bovine serum (FBS), 1% penicillin/streptomycin, and 1% sodium pyruvate at 37°C in an incubator with 5% CO ₂ . Cells were seeded in a 96-well plate at a density of 1×10^4 cells/well for 24h, with three replicates for each treatment. Cells were treated with Myrtillin at a range of concentrations (0, 50, 100, 200, 400, and 600µg/ml). After 24h of treatment, the cell viability was determined.
Reaction Conditions	0, 50, 100, 200, 400, and 600µg/ml; 24h
Applications	Myrtillin treatment inhibited the cell viability of HT-29 cells in a dose-dependent manner.
Animal experiment [2]:	
Animal models	KM mice

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Preparation Method	Postnatal day 7 KM mice were anesthetized with isoflurane and positioned supine on a sterile surgical platform. After skin disinfection with 75% ethanol, a midline cervical incision (approximately 5-10mm) was made. The right anterior cervical muscles were carefully dissected using ophthalmic forceps to expose the carotid sheath. The right common carotid artery was gently isolated from the vagus nerve using a glass dissecting needle and permanently ligated with a 4-0 silk suture to ensure complete occlusion. The wound was sutured and disinfected, and the entire surgical procedure was completed within 10min. Following surgery, mice were placed on bedding with maternal scent for 30min to recover before being returned to the dam for an additional hour. The mice were then placed in a 37°C sealed hypoxia chamber infused with a gas mixture of 8% oxygen and 92% nitrogen for 50min. Mice were randomly assigned to the Sham, HIE, and Myrtillin groups using a random number table. After hypoxia induction, mice were administered Myrtillin (20mg/kg) by intraperitoneal (i.p.) injection once daily for three consecutive days, after which brains were harvested for subsequent analysis.
Dosage form	20mg/kg/day; 3 days; i.p.
Applications	Myrtillin treatment reduced neuronal damage and cerebral infarction in mice with HIE.
References: [1] Mazewski C, Kim M S, Gonzalez de Mejia E. Anthocyanins, delphinidin-3-O-glucoside and cyanidin-3-O-glucoside, inhibit immune checkpoints in human colorectal cancer cells in vitro and in silico[J]. Scientific reports, 2019, 9(1): 11560. [2] Xu J, Hao P, Chen J, et al. Delphinidin-3-O-glucoside attenuates neonatal hypoxic-ischemic encephalopathy in a neonatal mouse model by reprogramming microglial polarization[J]. Frontiers in Pharmacology, 2026, 17: 1797078.	

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Background

Myrtillin is a cationic anthocyanin compound that inhibits epidermal growth factor receptor (EGFR) with an IC_{50} value of $2.37\mu M$ ^[1]. Myrtillin exhibits oxygen radical absorbance capacity (ORAC), scavenging power of ABTS ($EC_{50}=20.66\mu M$), and DPPH-free radical ($EC_{50}=60.37\mu M$) and inhibitory activity of α -glucosidase ($IC_{50}=239.7\mu M$)^[2]. Myrtillin combines with the bacterial protein FtsZ, NAD⁺-dependent DNA ligase, and amidase through hydrogen bonds and hydrophobic interactions, interfering with bacterial metabolism, inhibiting the production of ROS, and alleviating the oxidative damage caused by bacterial pathogens to *Caenorhabditis elegans*^[3]. Myrtillin has been widely used in tumor research to inhibit the proliferation of colorectal cancer cells and leukemia cells^[4].

In vitro, Myrtillin treatment for 24 hours markedly reduced the viability of HCT 116 and HT-29 cells, with IC_{50} values of $395.9\mu g/ml$ and $329.1\mu g/ml$, respectively^[5]. The combination treatment of $50\mu M$ Myrtillin and $1.25\mu g/ml$ lipopolysaccharide (LPS) for 24 hours induced the proliferation of mesenchymal stem cells (MSCs), promoting the increase of IL-10 and TGF- β levels and the decrease of NF- κB expression^[6]. Treatment with $200\mu M$ Myrtillin for 72h suppressed MDA-MB-231 migration by disrupting actin^[7].

In vivo, Myrtillin administration via intraperitoneal injection at a dose of 20mg/kg/day for 3 days reduced neuronal damage and cerebral infarction, and restored regional cerebral blood flow in a neonatal mouse model of hypoxic-ischemic encephalopathy (HIE)^[8]. Oral administration of Myrtillin at a dose of 20mg/kg/day for 12 weeks alleviated aortic lesions, oxidative stress, and inflammatory responses in a high-fat diet-induced rabbit model of atherosclerosis^[9].

References:

- [1] Mazewski C, Liang K, de Mejia E G. Comparison of the effect of chemical composition of anthocyanin-rich plant extracts on colon cancer cell proliferation and their potential mechanism of action using in vitro, in silico, and biochemical assays[J]. Food Chemistry, 2018, 242: 378-388.
- [2] Zhu C, Lü H, Du L, et al. Five blueberry anthocyanins and their antioxidant, hypoglycemic, and hypolipidemic effects in vitro[J]. Frontiers in nutrition, 2023, 10: 1172982.
- [3] Nas J S B. Myrtillin prolongs lifespan and enhances tolerance against pathogenic infections in

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[4] Iqbal S, Omara T, Kahwa I, et al. Anticancer potential of delphinidin and its derivatives: Therapeutic and mechanistic insights[J]. Medicinal Chemistry Research, 2024, 33(10): 1769-1786.

[5] Mazewski C, Kim M S, Gonzalez de Mejia E. Anthocyanins, delphinidin-3-O-glucoside and cyanidin-3-O-glucoside, inhibit immune checkpoints in human colorectal cancer cells in vitro and in silico[J]. Scientific reports, 2019, 9(1): 11560.

[6] Neves B R O, de Freitas S, Borelli P, et al. Delphinidin-3-O-glucoside in vitro suppresses NF-κB and changes the secretome of mesenchymal stem cells affecting macrophage activation[J]. Nutrition, 2023, 105: 111853.

[7] Viegas O, Faria M A, Sousa J B, et al. Delphinidin-3-O-glucoside inhibits angiogenesis via VEGFR2 downregulation and migration through actin disruption[J]. Journal of Functional Foods, 2019, 54: 393-402.

[8] Xu J, Hao P, Chen J, et al. Delphinidin-3-O-glucoside attenuates neonatal hypoxic-ischemic encephalopathy in a neonatal mouse model by reprogramming microglial polarization[J]. Frontiers in Pharmacology, 2026, 17: 1797078.

[9] Sun B, Li F, Zhang X, et al. Delphinidin-3-O-glucoside, an active compound of Hibiscus sabdariffa calyces, inhibits oxidative stress and inflammation in rabbits with atherosclerosis[J]. Pharmaceutical biology, 2022, 60(1): 247-254.

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