

Product Data Sheet

Product Name: Cyanidin Chloride

Cat. No.: GN10707

Chemical Properties

Cas. No. 528-58-5

Chemical Name 2-(3,4-dihydroxyphenyl)chromenylium-3,5,7-triol;chloride

SMILES C1=CC(=C(C=C1C2=C(C=C3C(=CC(=CC3=[O+])O)O)O)O)O.[Cl-]

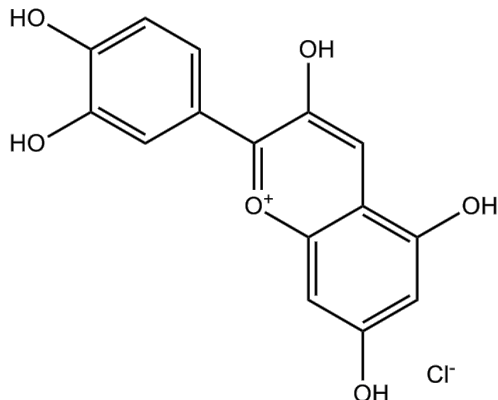
Formula $C_{15}H_{11}O_6Cl$ M.Wt 322.7

Solubility ≥ 33.3 mg/mL in DMSO, ≥ 13.04 mg/mL in EtOH, ≥ 10.83 mg/mL in Water with gentle warming
Storage Store at $-20^{\circ}C$

General tips For obtaining a higher solubility, please warm the tube at $37^{\circ}C$ and shake it in the ultrasonic bath for a while. Stock solution can be stored below $-20^{\circ}C$ 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

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

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Cell experiment [1]:

Cell lines HCT116, HT29, SW620 cells (human colorectal cancer cell lines)

Preparation Method Cells were cultured in a medium containing 10% heat-inactivated fetal bovine serum. The cells were treated with 50-100 μ M Cyanidin Chloride for 24 hours, and some experiments were conducted under tumor necrosis factor- α stimulation.

Reaction
Conditions 50-100 μ M; 24h.

Applications Cyanidin Chloride significantly inhibited the proliferation of the three colorectal cancer cell lines and induced apoptosis, while almost completely suppressing the colony formation ability of the cancer cells. Cyanidin Chloride inhibits the NF- κ B signaling pathway by suppressing the phosphorylation of I κ B α and IKK α / β and blocking the nuclear translocation of p65/p50, and activates the Nrf2 antioxidant pathway by promoting Nrf2 nuclear translocation and binding to the ARE promoter.

Animal experiment [2]:

Animal models C57BL/6J mice

Preparation Method Acute cardiomyopathy was induced by a single intraperitoneal injection of Doxorubicin (15mg/kg). Chronic cardiomyopathy was induced by intraperitoneal injections of Doxorubicin (3mg/kg) every other day for 2 weeks. Cyanidin Chloride or vehicle was administered intragastrically.

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Dosage form Acute model: 100 or 200mg/kg/day; i.g.; for 8 days. Chronic model:
50mg/kg/day; i.g.; for 5 weeks.

Applications Cyanidin Chloride administration significantly rescued Doxorubicin-induced declines in heart rate, left ventricular ejection fraction (EF), and fractional shortening (FS). Cyanidin Chloride reduced perivascular inflammatory cell infiltration, iron deposition, and the lipid peroxidation metabolite MDA level in heart tissue. Cyanidin Chloride alleviated ultrastructural mitochondrial damage and reversed the downregulated expression of proteins including Nrf2, Gpx4, and PGC1 in the heart.

References:

- [1] Lee DY, Yun SM, Song MY, et al. Cyanidin Chloride Induces Apoptosis by Inhibiting NF- κ B Signaling through Activation of Nrf2 in Colorectal Cancer Cells. *Antioxidants* (Basel). 2020 Mar 27;9(4):285.
- [2] Liu C, Wang Y, Zeng Y, et al. Use of Deep-Learning Assisted Assessment of Cardiac Parameters in Zebrafish to Discover Cyanidin Chloride as a Novel Keap1 Inhibitor Against Doxorubicin-Induced Cardiotoxicity. *Adv Sci* (Weinh). 2023 Oct;10(30):e2301136.

Background

Cyanidin Chloride is a subclass of anthocyanidins possessing antioxidant and anticancer activities [1-2]. Cyanidin Chloride can inhibit RANKL-induced NF- κ B activation, I κ B- α degradation, and ERK phosphorylation to reduce bone resorption. Cyanidin Chloride can be used for research related to osteoporosis and cancer [3-4].

In vitro, MC3T3-E1 cells were treated with Cyanidin Chloride (5mg/mL) for 24 hours. Cyanidin Chloride significantly reversed the decreased cell viability and increased apoptosis level caused by XIST overexpression. Cyanidin Chloride simultaneously enhanced intracellular alkaline phosphatase (ALP) activity and the expression of bone morphogenetic protein 2 (BMP2) and osteocalcin (OCN) [5]. Human colorectal cancer HCT116, HT29, and SW620 cells were treated with Cyanidin Chloride (50–

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100 μ M) for 24 hours. Under TNF- α stimulation, Cyanidin Chloride significantly inhibited cell proliferation and induced apoptosis. Cyanidin Chloride suppressed the NF- κ B signaling pathway by inhibiting the phosphorylation of I κ B α and IKK α / β and blocking the nuclear translocation of p65/p50. Cyanidin Chloride activated the Nrf2 antioxidant pathway by promoting Nrf2 nuclear translocation and binding to the ARE promoter^[6].

In vivo, C57BL/6J mice with acute or chronic cardiomyopathy were treated with Cyanidin Chloride (Acute model: 100 or 200mg/kg/day; intragastrically administered; for 8 days. Chronic model: 50mg/kg/day; intragastrically administered; for 5 weeks). Cyanidin Chloride significantly ameliorated the Doxorubicin-induced decline in cardiac function. Cyanidin Chloride reduced inflammatory cell infiltration, iron deposition, and the level of the lipid peroxidation metabolite MDA in heart tissue. Cyanidin Chloride also reversed ultrastructural mitochondrial damage and the downregulated expression of proteins including Nrf2, Gpx4, and PGC1 in the heart^[7]. C57BL/6J mice intranasally infected with the MRSA USA300 strain were subcutaneously administered Cyanidin Chloride (80mg/kg). Administration began 1 hour post-infection and was repeated every 12 hours for 4 days. Cyanidin Chloride significantly increased the survival rate of infected mice. Cyanidin Chloride also significantly reduced the bacterial load in lung tissue and alleviated pulmonary congestion and inflammatory cell infiltration^[8].

References:

- [1] Qu D, Ye Z, Zhang W, et al. Cyanidin Chloride Improves LPS-Induced Depression-Like Behavior in Mice by Ameliorating Hippocampal Inflammation and Excitotoxicity. ACS Chem Neurosci. 2022 Nov 2;13(21):3023-3033.
- [2] Cheng J, Zhou L, Liu Q, et al. Cyanidin Chloride inhibits ovariectomy-induced osteoporosis by suppressing RANKL-mediated osteoclastogenesis and associated signaling pathways. J Cell Physiol. 2018 Mar;233(3):2502-2512.
- [3] Jiang L, Li Z, Xie Y, et al. Cyanidin chloride modestly protects Caco-2 cells from ZnO nanoparticle exposure probably through the induction of autophagy. Food Chem Toxicol. 2019 May;127:251-259.
- [4] Takahama U, Hirota S, Yanase E. Slow starch digestion in the rice cooked with adzuki bean: Contribution of procyanidins and the oxidation products. Food Res Int. 2019 May;119:187-195.
- [5] Zhang Y, Yuan Q, Wei Q, et al. Long noncoding RNA XIST modulates microRNA-135/CREB1 axis to influence osteogenic differentiation of osteoblast-like cells in mice with tibial fracture healing. Hum Cell. 2022 Jan;35(1):133-149.
- [6] Lee DY, Yun SM, Song MY, et al. Cyanidin Chloride Induces Apoptosis by Inhibiting NF- κ B

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Signaling through Activation of Nrf2 in Colorectal Cancer Cells. Antioxidants (Basel). 2020 Mar 27;9(4):285.

[7] Liu C, Wang Y, Zeng Y, et al. Use of Deep-Learning Assisted Assessment of Cardiac Parameters in Zebrafish to Discover Cyanidin Chloride as a Novel Keap1 Inhibitor Against Doxorubicin-Induced Cardiotoxicity. Adv Sci (Weinh). 2023 Oct;10(30):e2301136.

[8] Su X, Yu H, Wang X, et al. Cyanidin chloride protects mice from methicillin-resistant Staphylococcus aureus-induced pneumonia by targeting Sortase A. Virulence. 2022 Dec;13(1):1434-1445.

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