

Product Data Sheet

Product Name: 7,8-Dihydroxyflavone

Cat. No.: GC16853

Chemical Properties

Cas. No. 38183-03-8

Chemical Name 7,8-dihydroxy-2-phenyl-4H-chromen-4-one

SMILES OC1=C(C2=CC=CC(=O)OC(C3=CC=CC=C3)=CC2=O)C3=CC=CC=C3

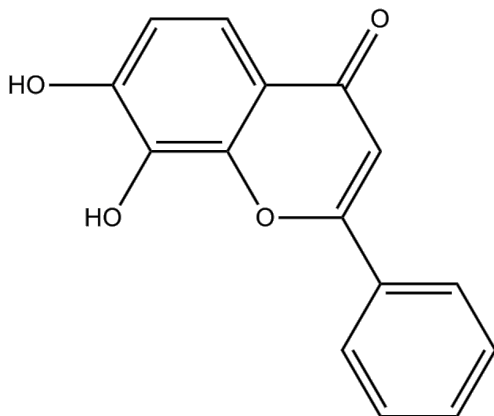
Formula $C_{15}H_{10}O_4$ M.Wt 254.24

Solubility $\geq 12.75\text{mg/mL}$ in DMSO Storage Store at 4°C, stored under nitrogen

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 Cardiac fibroblasts (CFs)

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

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Preparation Method	The cytotoxicity of 7,8-Dihydroxyflavone was evaluated by treating CFs with different concentrations of 7,8-Dihydroxyflavone (10, 30, 100, and 300μM) for 48h. The CFs were incubated with TGF-β1 (20ng/mL) for 48h with or without 7,8-Dihydroxyflavone. CFs were seeded on a 96-well plate and treated as designated, followed by the addition of CCK-8 reagent and incubated at 37°C for 2h. Optical density was detected using a microplate reader at 450nm.
Reaction Conditions	10, 30, 100, and 300μM; 48h
Applications	7,8-Dihydroxyflavone significantly decreased the viability of CF and inhibited the viability of TGF-β1-induced CFs in a dose-dependent manner.

Animal experiment [2]:

Animal models	C57BL/6 male mice
Preparation Method	1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) groups were administrated with MPTP (30mg/kg, i.p.) once a day for 5days. 7,8-Dihydroxyflavone (5mg/kg, i.p.) and chloroquine (50mg/kg, i.p.) were injected once a day during the whole process of experiments. The control groups received the same volume of sterile saline with or without 10% ethanol.
Dosage form	5mg/kg/day for 5days; Intraperitoneal injection
Applications	7,8-Dihydroxyflavone alleviates motor deficits and reduces the loss of dopaminergic neurons in MPTP-induced mouse model of Parkinson's disease.

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References:

- [1] Hang P Z, Liu J, Wang J P, et al. 7,8-Dihydroxyflavone alleviates cardiac fibrosis by restoring circadian signals via downregulating Bmal1/Akt pathway[J]. Eur J Pharmacol, 2023, 938: 175420.
- [2] Zuo L, Dai C, Yi L, et al. 7,8-dihydroxyflavone ameliorates motor deficits via regulating autophagy in MPTP-induced mouse model of Parkinson's disease[J]. Cell Death Discov, 2021, 7(1): 254.

Background

7,8-Dihydroxyflavone is a naturally-occurring plant-based flavone and high-affinity tyrosine kinase receptor B (TrkB) agonist with an IC_{50} value of $0.26\mu M$ ^[1,2]. TrkB is a protein tyrosine kinase receptor, and its primary ligand Brain-derived neurotrophic factor (BDNF) is expressed in neurons and skeletal muscles during the differentiation period and in the adult, promoting neuronal survival and differentiation, synaptic plasticity, and development of myoblasts and muscle fibers, as well as regulating energy metabolism and regeneration of the muscles^[3]. 7,8-Dihydroxyflavone can be used as an adjunctive treatment in schizophrenia^[4].

In vitro, treatment of MC3T3-E1 cells with 7,8-Dihydroxyflavone ($0.5-5\mu M$) for 24-48h resulted in a significant increase in cyclin mRNA levels in the cells, promoting cell proliferation and differentiation^[5]. After 48h treatment with 7,8-Dihydroxyflavone ($10-300\mu M$) in cardiac fibroblasts (CFs) stimulated by TGF- β 1, 7,8-Dihydroxyflavone significantly reduced the viability of CFs and inhibited TGF- β 1-induced CFs activity in a dose-dependent manner^[6].

In vivo, administration of 7,8-Dihydroxyflavone ($5mg/kg/day$) via intraperitoneal injection for 28days in mice fed a high-energy diet (cafeteria diet, CAF). 7,8-Dihydroxyflavone reduced body weight and downregulated the percentage indices of epididymal adipose tissue and adipocytes. The treatment also significantly decreased triglyceride, cholesterol, amylase, alanine aminotransferase (ALT), and glucose levels^[7]. In 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)-induced Parkinson's disease mice, 5-day intraperitoneal treatment with 7,8-Dihydroxyflavone ($5mg/kg/day$) effectively blocked the loss of tyrosine hydroxylase (TH)-positive neurons, exerted beneficial effects on motor function and neuropathology through autophagy mechanisms^[8].

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- [1] Paul R, Nath J, Paul S, et al. Suggesting 7,8-dihydroxyflavone as a promising nutraceutical against CNS disorders[J]. Neurochem Int, 2021, 148: 105068.
- [2] Tasdemir D, Kaiser M, Brun R, et al. Antitrypanosomal and antileishmanial activities of flavonoids and their analogues: in vitro, in vivo, structure-activity relationship, and quantitative structure-activity relationship studies[J]. Antimicrob Agents Chemother, 2006, 50(4): 1352-64.
- [3] Deng C, Chen H. Brain-derived neurotrophic factor/tropomyosin receptor kinase B signaling in spinal muscular atrophy and amyotrophic lateral sclerosis[J]. Neurobiol Dis, 2024, 190: 106377.
- [4] Du X, Hill R A. 7,8-Dihydroxyflavone as a pro-neurotrophic treatment for neurodevelopmental disorders[J]. Neurochem Int, 2015, 89: 170-80.
- [5] Xue F, Zhao Z, Gu Y, et al. 7,8-Dihydroxyflavone modulates bone formation and resorption and ameliorates ovariectomy-induced osteoporosis[J]. Elife, 2021, 10.
- [6] Hang P Z, Liu J, Wang J P, et al. 7,8-Dihydroxyflavone alleviates cardiac fibrosis by restoring circadian signals via downregulating Bmal1/Akt pathway[J]. Eur J Pharmacol, 2023, 938: 175420.
- [7] Sahin E, Saglam N, Erdem S, et al. 7,8-Dihydroxyflavone alleviates Endoplasmic Reticulum Stress in cafeteria diet-induced metabolic syndrome[J]. Life Sci, 2022, 306: 120781.
- [8] Zuo L, Dai C, Yi L, et al. 7,8-dihydroxyflavone ameliorates motor deficits via regulating autophagy in MPTP-induced mouse model of Parkinson's disease[J]. Cell Death Discov, 2021, 7(1): 254.

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