

Product Data Sheet

Product Name: Hydroxytyrosol

Cat. No.: GN10326

Chemical Properties

Cas. No. 10597-60-1

Chemical Name 4-(2-hydroxyethyl)benzene-1,2-diol

SMILES C1=CC(=C(C=C1CCO)O)O

Formula $C_8H_{10}O_3$ M.Wt 154.16

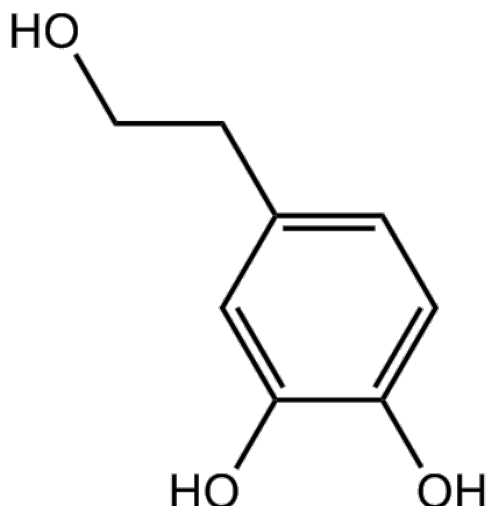
Solubility DMSO : 125 mg/mL (810.85 mM; Need ultrasonic); H_2O : 100 mg/mL (648.68 mM; Need ultrasonic); Ethanol : 50 mg/mL (324.34 mM; Need ultrasonic)

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

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

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Cell experiment [1]:

Cell lines SH-SY-5Y cells

SH-SY-5Y cells were pretreated with the indicated concentrations of Preparation Method Hydroxytyrosol (2, 5 and 10 μ M) for 24h, followed by a 6h treatment with 45mM glucose, and cell viability was then detected by the MTT method.

Reaction Conditions 2, 5 and 10 μ M; 24h

Applications Treatment with Hydroxytyrosol can dose-dependently increase cell viability.

Animal experiment [2]:

Animal models HFD C57BL/6 mice

C57BL/6 mice fed a high-fat diet with a daily oral gavage of 50mg/kg/day Hydroxytyrosol for 17 weeks. Body weight was recorded weekly, and organ weights (liver, perirenal fat, and epididymal fat) were measured at the end of the Preparation Method experiment. For the OGTT, after an overnight fasting, glucose was orally administered at 1g/kg body weight, and blood samples were collected from the retrobulbar vein at 0, 30, 60, 120, and 180min post-administration to assess glucose tolerance.

Dosage form 50mg/kg/day; 17 weeks; i.g.

Applications Treatment with Hydroxytyrosol significantly inhibited high-fat diet-induced weight gain and organ weight (liver, perirenal fat, epididymal fat) increases, and significantly improved OGTT results.

Background

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Hydroxytyrosol is a natural polyphenolic compound primarily found in olive leaves, possessing potent antioxidant activity^[1]. Hydroxytyrosol can effectively scavenge free radicals and protect cells from oxidative stress damage^[2], and is commonly used in the development of nutraceuticals and in research on anticancer, antithrombotic, anti-arteriosclerotic, and lipid-modulating^[3,4].

In vitro, SH-SY-5Y cells pretreated with Hydroxytyrosol (2, 5, and 10 μ M) for 24h followed by treatment with 45mM glucose for 6h exhibited a dose-dependent increase in cell viability^[5]. MC3T3-E1 cells were treated with Hydroxytyrosol (10, 50, and 100 μ M) for 18 days, which dose-dependently promoted calcium deposition and osteoblast mineralization^[6].

In vivo, oral administration of Hydroxytyrosol (50mg/kg/day) by gavage to C57BL/6 mice fed a high-fat diet (HFD) for 17 weeks significantly inhibited the HFD-induced increases in body weight and organ weights (liver, perirenal fat, epididymal fat) and significantly improved glucose tolerance (OGTT) results^[7]. *db/db* mice were orally administered Hydroxytyrosol (10mg/kg/day) for 8 weeks, which significantly increased the expression levels of mitochondrial complex I, II, and IV subunits in the cerebral cortex^[5].

References:

- [1] MANNA C, DELLA RAGIONE F, CUCCIOLLA V, et al. Biological effects of hydroxytyrosol, a polyphenol from olive oil endowed with antioxidant activity[J]. *Advances in Nutrition and Cancer* 2, 1999: 115-130.
- [2] RIETJENS S J, BAST A, HAENEN G R M M. New insights into controversies on the antioxidant potential of the olive oil antioxidant hydroxytyrosol[J]. *Journal of Agricultural and Food Chemistry*, 2007, 55(18): 7609-7614.
- [3] BERTELLI M, KIANI A K, PAOLACCI S, et al. Hydroxytyrosol: a natural compound with promising pharmacological activities[J]. *Journal of Biotechnology*, 2020, 309: 29-33.
- [4] ZHANG X, QIN Y, WAN X, et al. Hydroxytyrosol plays antiatherosclerotic effects through regulating lipid metabolism via inhibiting the p38 signal pathway[J]. *BioMed Research International*, 2020, 2020(1): 5036572.
- [5] ZHENG A, LI H, XU J, et al. Hydroxytyrosol improves mitochondrial function and reduces oxidative stress in the brain of *db/db* mice: role of AMP-activated protein kinase activation[J]. *British Journal of Nutrition*, 2015, 113(11): 1667-1676.
- [6] HAGIWARA K, GOTO T, ARAKI M, et al. Olive polyphenol hydroxytyrosol prevents bone loss[J].

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European Journal of Pharmacology, 2011, 662(1-3): 78-84.

[7] CAO K, XU J, ZOU X, et al. Hydroxytyrosol prevents diet-induced metabolic syndrome and attenuates mitochondrial abnormalities in obese mice[J]. Free Radical Biology and Medicine, 2014, 67: 396-407.

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