Dicoumarol

Cat. No.: HY-N0645

CAS No.: 66-76-2

Molecular Formula: $C_{19}H_{12}O_6$

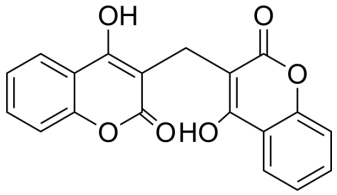
Molecular Weight: 336.29

Target: PDHK

Pathway: Metabolic Enzyme/Protease

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

H_2O : 25 mg/mL (74.34 mM; ultrasonic and adjust pH to 11 with NaOH)
DMSO : 3.67 mg/mL (10.91 mM; Need ultrasonic)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	2.9736 mL	14.8681 mL	29.7362 mL
	5 mM	0.5947 mL	2.9736 mL	5.9472 mL
	10 mM	0.2974 mL	1.4868 mL	2.9736 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 1.67 mg/mL (4.97 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Dicoumarol is an inhibitor of both NAD(P)H:quinone oxidoreductase 1 (NQO1) and PDK1 with IC_{50}s of 0.37 and 19.42 μM, respectively.

IC_{50} & Target

IC50: 0.37 μM (NQO1)[1], 19.42 μM (PDK1)[2]

In Vitro

Dicoumarol is an inhibitor of both NAD(P)H:quinone oxidoreductase 1 (NQO1) and PDK1 with IC_{50}s of 0.37±0.15 and 19.42±0.032 μM, respectively. The PDK1 activity is inhibited by Dicoumarol in a dose-dependent manner. The enzymatic activity of PDK1 is reduced by approximately 94% when treated with 200 μM Dicoumarol. Dicoumarol decreases the p-PDHA1 level by 26% (100 μM Dicoumarol) and by 72% (200 μM Dicoumarol), with no statistical difference in the total PDHA1 level. Both 100 μM and 200 μM Dicoumarol markedly induce apoptosis of SKOV3 cells. Similarly, flow cytometric analysis of annexin V^+PI^+ cells reveals that 100 μM and 200 μM Dicoumarol treatments generate approximately 20.87% and 24.94%

	apoptotic cells, respectively, significantly higher than vehicle treatment[2]. It is also observed that treatment of MCF-7-TAMR cells with Dicoumarol, a known NQO1 inhibitor, reverses their Tamoxifen-resistance phenotype[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Dichloroacetate (DCA) at 100 mg/kg, Dicoumarol at 30 mg/kg, and Dicoumarol at 50 mg/kg all significantly reduce tumor volume and decrease tumor weight, when compare to tumors from control or vehicle groups. Total caspase-3 and total anti-poly (ADP-ribose) polymerase (PARP) are significantly decreased in Dicoumarol-treated SKOV3 xenografts, when compare to tumors from the control or vehicle group[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	The in vitro cell viability is examined using the standard MTT assay. SKOV3 or A2780 cells are seeded in 96-well plates at 8000 cells/well. The next day, increasing concentrations of Dicoumarol (DIC) are added into each well, and the plate is incubated for 24 h. Then, 10 μL of 10 mg/mL MTT reagent in phosphate-buffered saline (PBS) is added into each well, and the plate is incubated for an additional 4 h. The formazan crystals are dissolved in 150 μL of DMSO, and after the plate is shaken for 5 min, the optical density at 570 nm is recorded by the reader[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Twenty five female BALB/c-nu mice aged 5 to 6 weeks old and weighing approximately 15 g each are used. A total of 1×10^7 SKOV3 cells are subcutaneously injected into the upper flank. After 10 days, when the tumor volume reaches approximately 100 mm^3, the nude mice are randomized into five groups (n=5/group) and are given the following treatments intraperitoneally (i.p.) every other day, for a total of 12 days: control group, administered with 0.2 mL of 0.9% NaCl; vehicle group, administered with 1 mM NaOH; dichloroacetate (DCA) group, administered with 100 mg/kg DCA; Dicoumarol (DIC)-30 group, administered with 30 mg/kg Dicoumarol; and Dicoumarol-50 group, administered with 50 mg/kg Dicoumarol. The body weights and tumor volumes of each mouse are monitored every other day until sacrifice (on day 12 after the initial treatment)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- J Control Release. 2022 May 31;347:632-648.
- Phytomedicine. 2021, 153479.
- J Funct Foods. 2019, 103562.
- Bioorg Chem. 7 October 2022, 106191.
- Chem Biol Interact. 2022 Oct 13;110222.

See more customer validations on www.MedChemExpress.com

REFERENCES

[1]. Bian J, et al. Affinity-based small fluorescent probe for NAD(P)H:quinone oxidoreductase 1 (NQO1). Design, synthesis and pharmacological evaluation. Eur J Med Chem. 2017 Feb 15;127:828-839.

[2]. Zhang W, et al. Dicumarol inhibits PDK1 and targets multiple malignant behaviors of ovarian cancer cells. PLoS One. 2017 Jun 15;12(6):e0179672.

[3]. Fiorillo M, et al. Mitochondrial "power" drives tamoxifen resistance: NQO1 and GCLC are new therapeutic targets in breast cancer. Oncotarget. 2017 Mar 2;8(12):20309-20327.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com
Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA