Quercetin

Cat. No.: HY-18085

CAS No.: 117-39-5

Molecular Formula: $C_{15}H_{10}O_7$

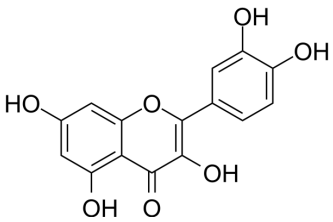
Molecular Weight: 302.24

Target: PI3K; Autophagy; Mitophagy; Apoptosis; Reactive Oxygen Species

Pathway: PI3K/Akt/mTOR; Autophagy; Apoptosis; Immunology/Inflammation; Metabolic Enzyme/Protease; NF-κB

Storage:

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



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (330.86 mM; Need ultrasonic)
Ethanol : 16.67 mg/mL (55.15 mM; Need ultrasonic)

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	3.3086 mL	16.5431 mL	33.0863 mL
5 mM	0.6617 mL	3.3086 mL	6.6173 mL
10 mM	0.3309 mL	1.6543 mL	3.3086 mL

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

In Vivo

1. Add each solvent one by one: 0.5% CMC-Na/saline water
   Solubility: 25 mg/mL (82.72 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 45% PEG300 >> 5% Tween-80 >> 50% saline
   Solubility: 10 mg/mL (33.09 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 50% PG >> 50% Saline
   Solubility: 10 mg/mL (33.09 mM); Suspended solution; Need ultrasonic
4. Add each solvent one by one: 50%PG >> 50%Saline
   Solubility: 10 mg/mL (33.09 mM); Suspended solution; Need ultrasonic
5. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (8.27 mM); Clear solution
6. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (8.27 mM); Clear solution

BIOLOGICAL ACTIVITY

Description	Quercetin, a natural flavonoid, is a stimulator of recombinant SIRT1 and also a PI3K inhibitor with IC_{50} of 2.4 μM, 3.0 μM and 5.4 μM for PI3K γ, PI3K δ and PI3K β, respectively[1].
IC_{50} & Target	PI3Kδ 2.4 μM (IC_{50}) PI3Kγ 3 μM (IC_{50}) PI3Kβ 5.4 μM (IC_{50}) Autophagy Mitophagy
In Vitro	Quercetin is a type of plant-based chemical, or phytochemical, used as an ingredient in supplements, beverages or foods. In several studies, it may have anti-inflammatory and antioxidant properties, and it is being investigated for a wide range of potential health benefits. Quercetin is a PI3K inhibitor with IC_{50} of 2.4-5.4 μM. Quercetin strongly abrogates PI3K and Src kinases, mildly inhibits Akt1/2, and slightly affected PKC, p38 and ERK1/2[1]. Quercetin inhibits TNF-induced LDH% release, EC-dependent neutrophils adhesion to bovine pulmonary artery endothelial cells (BPAEC), and BPAEC DNA synthesis and proliferation[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Combination of Quercetin (75 mg/kg) and 2-Methoxyestradiol enhances inhibition of human prostate cancer LNCaP and PC-3 cells xenograft tumor growth[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [3]	Mice are inoculated subcutaneously with 5×10^5 PC-3 cells suspended in 100μL PBS and 2×10^8 LNCaP cells suspended in 100 μL of matrigel and PBS mixture (1:1) on the right back. When xenograft tumors reach a volume of approximately 100 mm^3, mice are randomLy assigned to four groups (n=8 each group) and treated intraperitoneally. Therapeutic schedule based on our in vitro results, preliminary experiments and many other researchers' studies is as follows: (1) Vehicle control group: vehicle of quercetin on day 1, vehicle of 2-ME on day 2, (2) Quercetin treated group: quercetin 75 mg/kg on day 1, vehicle of 2-ME on day 2, (3) 2-ME treated group: vehicle of quercetin on day 1, 2-ME 150 mg/kg on day 2, (4) Combination treatment group: quercetin 75 mg/kg on day 1, 2-ME 150 mg/kg on day 2. Two days is a treatment cycle and the whole treatment process lasted for 4 weeks. Tumor sizes are monitored every 2 days using caliper and tumor volume are calculated according to the formula: L×S2×0.5, in which L represents the longest diameter and S represents the shortest diameter of tumor. Mice are weighed as well. At the end of treatment procedure, on day 29, mice are anesthetized with chloral hydrate and sacrificed by cervical dislocation. Xenograft tumors are taken out quickly and weighed. One part of it is put into liquid nitrogen immediately for future biomarker analysis and the other part is fixed in 10% neutral buffered formalin for immunohistochemical analysis. Serum biochemical parameters such as ALT, AST, creatinine and urea nitrogen that reflected drug toxicity are also detected. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Adv Funct Mater. 27 January 2022.
- Environ Pollut. 25 August 2021, 118036.
- Food Chem. 2022: 134807.
- Free Radic Biol Med. 2024 Jan 6:S0891-5849(24)00002-9.
- Cell Mol Gastroenterol Hepatol. 2022 Apr 2;14(1):75-99.

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REFERENCES

[1]. Leyre Navarro-Núñez, et al. Effect of quercetin on platelet spreading on collagen and fibrinogen and on multiple platelet kinases. Fitoterapia. 2010 Mar;81(2):75-80.

[2]. Yu XB, et al. Inhibitory effects of protein kinase C inhibitors on tumor necrosis factor induced bovine pulmonary artery endothelial cell injuries. Yao Xue Xue Bao. 1996;31(3):176-81.

[3]. Yang F, et al. Combination of Quercetin and 2-Methoxyestradiol Enhances Inhibition of Human Prostate Cancer LNCaP and PC-3 Cells Xenograft Tumor Growth. PLoS One. 2015 May 26;10(5):e0128277.

[4]. Tao Liu, et al. Quercetin alleviates kidney fibrosis by reducing renal tubular epithelial cell senescence through the SIRT1/PINK1/mitophagy axis. Life Sci. 2020 Jul 20;118116.

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