**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; Reactive Oxygen Species; Apoptosis
- **Pathway:** PI3K/Akt/mTOR; Autophagy; Immunology/Inflammation; Metabolic Enzyme/Protease; NF-κB; Apoptosis
- **Storage:**
  - Powder
    - -20°C: 3 years
    - 4°C: 2 years
  - In solvent
    - -80°C: 6 months
    - -20°C: 1 month

**SOLVENT & SOLUBILITY**

**In Vitro**

- **DMSO:** ≥ 100 mg/mL (330.86 mM)
- **Ethanol:** 10 mg/mL (33.09 mM; Need ultrasonic)

* "≥" means soluble, but saturation unknown.

<table>
<thead>
<tr>
<th>Preparing Stock Solutions</th>
<th>Concentration</th>
<th>Mass 1 mg</th>
<th>Mass 5 mg</th>
<th>Mass 10 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mM</td>
<td>3.3086 mL</td>
<td>16.5431 mL</td>
<td>33.0863 mL</td>
</tr>
<tr>
<td></td>
<td>5 mM</td>
<td>0.6617 mL</td>
<td>3.0386 mL</td>
<td>6.6173 mL</td>
</tr>
<tr>
<td></td>
<td>10 mM</td>
<td>0.3309 mL</td>
<td>1.6543 mL</td>
<td>3.0863 mL</td>
</tr>
</tbody>
</table>

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: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   - Solubility: ≥ 2.5 mg/mL (8.27 mM); Clear solution

3. 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

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: 50%PG >> 50%Saline
   - Solubility: 10 mg/mL (33.09 mM); Suspended solution; Need ultrasonic

**BIOLOGICAL ACTIVITY**
Quercetin, a natural flavonoid, is a stimulator of recombinant SIRT1 and also a PI3K inhibitor with IC\textsubscript{50} of 2.4 μM, 3.0 μM and 5.4 μM for PI3K γ, PI3K δ and PI3K β, respectively[1].

<table>
<thead>
<tr>
<th>IC\textsubscript{50} &amp; Target</th>
<th>PI3Kδ</th>
<th>PI3Kγ</th>
<th>PI3Kβ</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC\textsubscript{50}</td>
<td>2.4 μM</td>
<td>3 μM</td>
<td>5.4 μM</td>
</tr>
<tr>
<td>Autophagy</td>
<td>Mitophagy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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\textsubscript{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].

Combination of Quercetin (75 mg/kg) and 2-Methoxyestradiol enhances inhibition of human prostate cancer LNCaP and PC-3 cells xenograft tumor growth[3].

Mice are inoculated subcutaneously with 5×10\textsuperscript{5} PC-3 cells suspended in 100μL PBS and 2×10\textsuperscript{8} LNCaP cells suspended in 100μL of matrigel and PBS mixture (1:1) on the right back. When xenograft tumors reach a volume of approximately 100 mm\textsuperscript{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×S\textsuperscript{2}×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.

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REFERENCES


