Gallic acid

**Cat. No.:** HY-N0523  
**CAS No.:** 149-91-7  
**Molecular Formula:** C₇H₆O₅  
**Molecular Weight:** 170.12  
**Target:** COX; Reactive Oxygen Species; Apoptosis; Ferroptosis; Endogenous Metabolite  
**Pathway:** 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**

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Concentration</th>
<th>Mass (mg/mL)</th>
<th>1 mg</th>
<th>5 mg</th>
<th>10 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>≥ 100 mg/mL (587.82 mM)</td>
<td>5.8782 mL</td>
<td>29.3910 mL</td>
<td>58.7820 mL</td>
<td></td>
</tr>
<tr>
<td>H₂O</td>
<td>8.33 mg/mL (48.97 mM; ultrasonic and warming and heat to 60°C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* “≥” means soluble, but saturation unknown.

#### Preparing Stock Solutions

**1 mM**  
- Mass: 5.8782 mL  
- Volume: 1000 µL  

**5 mM**  
- Mass: 1.1756 mL  
- Volume: 2000 µL  

**10 mM**  
- Mass: 0.5878 mL  
- Volume: 1000 µL

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: ≥ 2.5 mg/mL (14.70 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
   Solubility: ≥ 2.5 mg/mL (14.70 mM); Clear solution

### BIOLOGICAL ACTIVITY

**Description**

Gallic acid (3,4,5-Trihydroxybenzoic acid) is a natural polyhydroxyphenolic compound and an free radical scavenger to inhibit cyclooxygenase-2 (COX-2)\(^1\). Gallic acid has various activities, such as antimicrobial, antioxidant, antimicrobial, anti-inflammatory, and anticancer activities\(^2\).

**IC₅₀ & Target**

<table>
<thead>
<tr>
<th>In Vitro</th>
<th>COX-2</th>
<th>Microbial Metabolite</th>
<th>Human Endogenous Metabolite</th>
</tr>
</thead>
</table>

**IC₅₀**

Gallic acid is an antioxidant which can inhibit both COX-2\(^1\). After 18h treatment with Gallic acid, the number of viable neutrophils is dramatically decreased from 40.3% to 27.7%, highly comparable with 26.4% for untreated neutrophils. Gallic
Acid fails to attenuate isoproterenol-induced myocytolysis\[^3\].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

### In Vivo

The food intake (2.6±0.08 g/day, p=0.69) and the body weight (2.5±0.69 g, p=0.76) of the Gallic acid group do not differ significantly from those of the control group (food intake: 2.41±0.14 g/day and the body weight: 2.83±0.84 g/day). The blood glucose tolerance in the Gallic acid group is significantly improved after 2 weeks of treatment. The blood glucose tolerance of the Gallic acid group after a treatment period of 2 weeks is also significantly better than that of the control group at 90 and 120 min (p<0.05). The serum triglyceride concentration in the Gallic acid group (0.67±0.03 mM, p<0.05) is significantly reduced relative to that of the control group (1.08±0.20 mM). The total cholesterol concentration is similar in the control (3.19±0.27 mM) and Gallic acid (3.01±0.18 mM) groups\[^2\].

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### PROTOCOL

#### Cell Assay\[^3\]

Neutrophils are treated with 8 μg/mL Gallic acid in RPMI1640/10% FBS for 3, 6, 9, and 18 h. At the end of Gallic acid treatment, the cells are stained with Annexin V-FITC and PI according to manufacturer's instructions. Briefly, the cells are washed twice with ice-cold PBS and resuspended in 1× Binding Buffer at a concentration of 1×10^6 cells/mL. Cell suspensions (1×10^5 cells in 100 μL) are incubated with 5 μL of Annexin V-FITC and 10 μL PI in a 5 mL culture tube at room temperature for 20 min. The stained cells are immediately analyzed on flow cytometry system\[^3\].

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#### Animal Administration\[^2\]

Five-week-old male C57BL/6 mice are used in this study. The animals are maintained in a temperature-controlled room at 22°C on a 12 h light-dark photocycle. The mice are divided into the control vehicle group and the Gallic acid group. For 2 weeks, the mice are administered intraperitoneal treatment on a daily basis with vehicle (10% alcohol, 10% tween 80, and 80% saline) alone or with 10 mg/kg Gallic acid. After this treatment, GTTs are again conducted, and the blood samples are taken for subsequent biochemical analysis. Over the experimental period, food intake and body weight are measured on a daily basis\[^2\].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

### CUSTOMER VALIDATION

- Biomaterials. 2021, 120952.
- Eur J Pharmacol. 2022 May 18;926:175041.
- J Appl Toxicol. 2022 Aug 18.

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### REFERENCES


