# [6]-Gingerol

**Cat. No.:** HY-14615

**CAS No.:** 23513-14-6

**Molecular Formula:** $C_{17}H_{26}O_4$

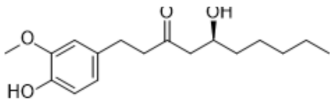
**Molecular Weight:** 294.39

**Target:** AMPK; Apoptosis

**Pathway:** Epigenetics; PI3K/Akt/mTOR; Apoptosis

**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 : 50 mg/mL (169.84 mM; Need ultrasonic)

| Preparing Stock Solutions | Mass / Solvent / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|---|
| | 1 mM | 3.3969 mL | 16.9843 mL | 33.9685 mL |
| | 5 mM | 0.6794 mL | 3.3969 mL | 6.7937 mL |
| | 10 mM | 0.3397 mL | 1.6984 mL | 3.3969 mL |

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

**In Vivo**

1. Add each solvent one by one: 50% PEG300 >> 50% saline
   Solubility: 25 mg/mL (84.92 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (8.49 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (8.49 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (8.49 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

[6]-Gingerol is an active compound isolated from Ginger (Zingiber officinale), exhibits a variety of biological activities including anticancer, anti-inflammation, and anti-oxidation.

| $IC_{50}$ & Target | | |
|---|---|---|
| | AMPK | Apoptosis |

| | |
|---|---|
| **In Vitro** | [6]-gingerol inhibits colon cancer cell proliferation and induced apoptosis, while the normal colon cells are unaffected. [6]-gingerol down-regulates phorbol myristate acetate induced phosphorylation of ERK1/2 and JNK MAP kinases and activation of AP-1 transcription factor, but has only little effects on phosphorylation of p38 MAP kinase and activation of NF-kappa B[1]. [6]-gingerol treatment is shown to restore impaired intestinal barrier function and to suppress proinflammatory responses in DSS-treated Caco-2 monolayers. AMPK is activated on [6]-gingerol treatment[2]. Treatment with [6]-gingerol results in a significant decrease in the viability of osteosarcoma cells in a dose-dependent fashion. In parallel, the number of cells arrested at the sub-G1 cell cycle phase is significantly increased. [6]-gingerol induces activation of caspase cascades and regulates cellular levels of Bcl2 and Bax[3].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **In Vivo** | In animal studies, [6]-gingerol significantly ameliorates DSS-induced colitis by restoration of body weight loss, reduction in intestinal bleeding, and prevention of colon length shortening. In addition, [6]-gingerol suppresses DSS-elevated production of proinflammatory cytokines (IL-1β, TNFα, and IL-12)[2].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## PROTOCOL

| | |
|---|---|
| **Cell Assay [1]** | [6]-gingerol stock (20 mg/mL) is prepared in ethanol and the working concentrations are prepared by diluting this stock in dimethyl sufoxide (DMSO). For MTT assay, $5\times10^3$ cells/well of human colon cancer cells and $10^4$ cells/well of mouse IECs are seeded in 96-well plates. Cells are treated with [6]-gingerol for 48 h,72 h or 96 h before performing MTT assay and for 16 h before Annexin-V staining[1].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **Animal Administration [2]** | Mice: Mice with DSS-induced colitis are given different oral dosages of [6]-gingerol daily for 14 days. Body weight and colon inflammation are evaluated, and level of proinflammatory cytokines in colon tissues is measured[2].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## CUSTOMER VALIDATION

- PLoS Biol. 2018 Jul 12;16(7):e2004921.
- Free Radic Biol Med. 2023 Dec 30:212:284-294.
- J Ethnopharmacol. 8 November 2021, 114786.
- Kaohsiung J Med Sci. 2021 Dec 28.

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## REFERENCES

[1]. Radhakrishnan EK, et al. [6]-Gingerol induces caspase-dependent apoptosis and prevents PMA-induced proliferation in colon cancer cells by inhibiting MAPK/AP-1 signaling. PLoS One. 2014 Aug 26;9(8):e104401.

[2]. Chang KW, et al. 6-Gingerol modulates proinflammatory responses in dextran sodium sulfate (DSS)-treated Caco-2 cells and experimental colitis in mice through adenosine monophosphate-activated protein kinase (AMPK) activation. Food Funct. 2015 Oct;6(10):3334-41.

[3]. Fan J, et al. 6-Gingerol inhibits osteosarcoma cell proliferation through apoptosis and AMPK activation. Tumour Biol. 2015 Feb;36(2):1135-41.

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

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