Menadione

Cat. No.: HY-B0332

CAS No.: 58-27-5

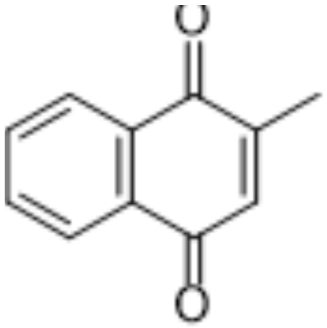
Molecular Formula: $C_{11}H_8O_2$

Molecular Weight: 172.18

Target: Endogenous Metabolite

Pathway: Metabolic Enzyme/Protease

Storage: 4°C, sealed storage, away from moisture and light
* In solvent : -80°C, 1 year; -20°C, 6 months (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 125 mg/mL (725.98 mM; Need ultrasonic)
Ethanol : 9.09 mg/mL (52.79 mM; Need ultrasonic)
H_2O : 0.1 mg/mL (0.58 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	5.8079 mL	29.0394 mL	58.0788 mL
5 mM	1.1616 mL	5.8079 mL	11.6158 mL
10 mM	0.5808 mL	2.9039 mL	5.8079 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: ≥ 2.08 mg/mL (12.08 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (12.08 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (12.08 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Menadione is a naphthoquinone that is converted into active vitamin K2 in the body. Menadione is a potential anticancer agent and radiosensitizer[1].

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

Menadione (0-100 μM, 24-72 h) induces necrosis at high concentrations (100 μM) and apoptosis at low concentrations (10-20

μM) in AR4-2J cells[2].

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

Cell Proliferation Assay[2]

Cell Line:	AR4-2J cells
Concentration:	0-100 μM
Incubation Time:	24-72 h
Result:	Inhibited cell proliferation in time- and dose-dependently manner at lower concentrations (1-20 μM).

Western Blot Analysis[2]

Cell Line:	AR4-2J cells
Concentration:	0-100 μM
Incubation Time:	24 h
Result:	Induced wild-type P53 at the dose of 1-20 μM. Induced a low level of wild-type P53 at the dose of 100 μM.

In Vivo

Menadione (25-150 mg/kg, i.v., once time or every other day for five times) produces more severe lesionsin male Wister rats with a single injection than five injections [1].

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

Animal Model:	Male Wister rats[1]
Dosage:	25-150 mg/kg
Administration:	i.v., once time or every other day for five times
Result:	Showed microgranular degeneration of renal tubular cells at the dose of 25 mg/kg. Observed microgranular degeneration of renal tubular cells and mild pulmonary hemorrhage at the dose of 50 mg/kg. Produced lesions in the kidney, heart, liver and lung at the dose of 100-150 mg/kg. Showed kidney apoptosis at the dose of 100-150 mg/kg.

CUSTOMER VALIDATION

- Cell Stem Cell. 2021 Sep 14;S1934-5909(21)00343-X.
- Nat Commun. 2022 Nov 17;13(1):7031.
- Nat Commun. 2021 Aug 16;12(1):4961.
- Autophagy. 2020 Sep;16(9):1683-1696.
- Int J Biol Macromol. 2021 Apr 24.

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REFERENCES

[1]. Chiou TJ, et al. Cardiac and renal toxicity of menadione in rat. Toxicology. 1997 Dec 31;124(3):193-202.

[2]. Sata N, et al. Menadione induces both necrosis and apoptosis in rat pancreatic acinar AR4-2J cells. Free Radic Biol Med. 1997;23(6):844-50.

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