MCE MedChemExpress

Product Data Sheet

Menaquinone-4

Cat. No.: HY-B2156

CAS No.: 863-61-6

Molecular Formula: $C_{31}H_{40}O_2$

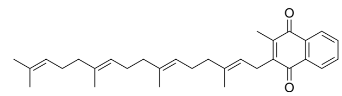
Molecular Weight: 444.65

Target: Endogenous Metabolite

Pathway: Metabolic Enzyme/Protease

Storage: 4°C, protect from light

* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 10 mg/mL (22.49 mM; Need ultrasonic)

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	2.2490 mL	11.2448 mL	22.4896 mL
5 mM	0.4498 mL	2.2490 mL	4.4979 mL
10 mM	0.2249 mL	1.1245 mL	2.2490 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 (4.68 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2 mg/mL (4.50 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2 mg/mL (4.50 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Menaquinone-4 is a vitamin K, used as a hemostatic agent, and also a adjunctive therapy for the pain of osteoporosis.

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

Menaquinone-4 (MK-4, 0, 1, 5, 10 μM) increases the ALP activity in Caco-2 cells. Menaquinone-4 (1 μM) significantly increases intensities of hSI expression[1].

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

In Vivo

Menaquinone-4 (K2, 0.2 g/kg diet) in HF-K2 group produces epididymal fat in C57BL/6J mice, and also increases the bone

	density of mice[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [1]	Caco-2 cells are plated at a density of 2-5 × 10^4 cells/cm^2 onto a 35-mm dish. Cells are incubated for 2 to 3 days until 60%-70% confluency, and desired concentrations of Menaquinone-4 (0, 1.0, 5.0, and 10.0 μM) are added. The final concentration of the vehicle is 0.1% of the culture medium, and the culture medium is changed twice a week. Cells are assayed on days 0, 3, 7, and 11 after the addition of Menaquinone-4[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Forty-two male, 4-week-old C57BL/6J mice provided with feed and drink ad libitum. For environmental adaptation, the animals had 1 week of circulation, and then are provided with the experimental diet after being randomly divided into 6 groups (7 animals in each group; randomized block design). The AIN-93G diets consist of a normal diet (N), normal diet + vitamin K1 (N-K1), normal diet + vitamin Menaquinone-4 (N-K2), 45% high-fat diet (HF), 45% high-fat diet + vitamin K1 (HF-K1), and a 45% high-fat diet + vitamin Menaquinone-4 (HF-K2). The vitamin K1 and vitamin Menaquinone-4 contents are 200 mg/1,000 g, and the diet is provided in pellet form. Body weight is measured once a week, and the food efficiency ratio (FER) is calculated by dividing the increased body weight from day 1 to the final day by the food intake amount during the experiment period. For fat amount measurement, the epididymal fat, perirenal fat, and retroperitoneal fat are extracted from dead animal subjects, are washed with 0.9% NaCl, dried by filter paper, and then are weighed[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Noda S, et al. Menaquinone-4 (vitamin K2) up-regulates expression of human intestinal alkaline phosphatase in Caco-2 cells. Nutr Res. 2016 Nov;36(11):1269-1276.

[2]. Kim M, et al. Vitamin K1 (phylloquinone) and K2 (menaquinone-4) supplementation improves bone formation in a high-fat diet-induced obese mice. J Clin Biochem Nutr. 2013 Sep;53(2):108-13.

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