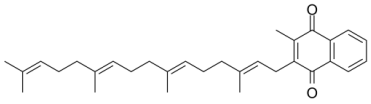
Data Sheet

Product Name:	Menaquinone-4
Cat. No.:	CS-0020307
CAS No.:	863-61-6
Molecular Formula:	C31H40O2
Molecular Weight:	444.65
Target:	Others
Pathway:	Others
Solubility:	H2O : < 0.1 mg/mL (insoluble); DMSO : 20.83 mg/mL (46.85 mM; Need ultrasonic)



BIOLOGICAL ACTIVITY:

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

PROTOCOL (Extracted from published papers and Only for reference)

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]. **Animal Administration:** Menaquinone-4 is prepared in diet.[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].

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.

CAIndexNames:

1,4-Naphthalenedione, 2-methyl-3-[(2E,6E,10E)-3,7,11,15-tetramethyl-2,6,10,14-hexadecatetraen-1-yl]-

SMILES:

O=C1C(C)=C(C/C=C(C)/CC/C=C(C)/CC/C=C(C)/CC/C=C(C)\C)C(C2=C1C=CC=C2)=O

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