(R)-Equol

Cat. No.: HY-108414

CAS No.: 221054-79-1

Molecular Formula: $C_{15}H_{14}O_3$

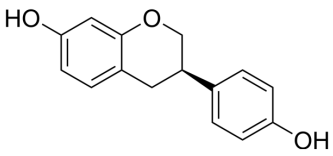
Molecular Weight: 242.27

Target: Estrogen Receptor/ERR

Pathway: Vitamin D Related/Nuclear Receptor

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (412.76 mM; Need ultrasonic and warming)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	4.1276 mL	20.6381 mL	41.2763 mL
	5 mM	0.8255 mL	4.1276 mL	8.2553 mL
	10 mM	0.4128 mL	2.0638 mL	4.1276 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: ≥ 2.5 mg/mL (10.32 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (10.32 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (10.32 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

(R)-Equol is an agonist of both ERα and ERβ with K_is of 27.4 and 15.4 nM, respectively.

IC_{50} & Target

Ki: 27.4 nM (ERα), 15.4 nM (ERβ)[1]

In Vitro

(R)-Equol is an agonist of both ERα and ERβ with K_is of 27.4 and 15.4 nM, respectively[1]. (R)-Equol induces a dose-dependent inhibitory effect on the invasive capacity of MDA-MB-231 cells that is significant at the highest concentration tested (50 μM). Following 48-h exposure to (R)-Equol, invasion is reduced by 62% (p=0.009, versus untreated cells) with 50 μM (R)-Equol.

	Matrix metalloproteinase-2 (MMP-2) expression is significantly down-regulated following treatment with 50 μM (R)-Equol (p=0.035)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Animals fed (R)-Equol have a significantly reduced number of palpable tumors over time when compare with Controls (P=0.002). Furthermore, the number of palpable tumors formed per rat in the (R)-Equol-fed group is significantly lower than that of rats treated with S-(-)equol (P=0.008). (R)-Equol-fed animals have 43% fewer tumors than the control group and this difference is highly statistically significant (P=0.004). The number of tumors/tumor-bearing animal is significantly lower in the animals fed (R)-Equol compare with Controls (3.3±0.4 versus 5.5±0.5, P=0.004). At necropsy, the mean (±SEM) tumor weight per animal for (R)-Equol fed rats (5.3±1.1 mg) is significantly reduced (P=0.04) when compare with Controls (9.9±1.4 mg). Feeding the (R)-Equol diet results in significantly increased tumor latency (P=0.003)[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	Cell viability is determined using the well-established MTT assay. Cells are seeded (1.25×10^5 cells/mL) in 96-well plates in experimental medium (100 μL/well) and incubated for 48 h at 37°C in a 95 % air/5 % CO_2 humidified atmosphere. Medium is then replaced with fresh medium containing (R)-Equol (R-equol) (2.5, 10 or 50 μM) or DMSO only as a control. Following 48-h incubation, cell viability is assessed[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [3]	To investigate the chemopreventive effects of dietary (R)-Equol against chemically induced mammary cancer, female Sprague-Dawley rats bred in-house are fed a soy-free AIN-93G diet from birth to 35 days of age, then separated into different groups. Group 1 (Control group, n=40) continues on this diet, whereas the other group of animals are fed the AIN-93G diet supplemented with 250 mg/kg of (R)-Equol (Group 3, n=41) beginning on day 35 until killing on day 190[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Setchell KD, et al. S-equol, a potent ligand for estrogen receptor beta, is the exclusive enantiomeric form of the soy isoflavone metabolite produced by human intestinal bacterial flora. Am J Clin Nutr. 2005 May;81(5):1072-9.

[2]. Magee PJ, et al. Daidzein, R-(+)equol and S-(-)equol inhibit the invasion of MDA-MB-231 breast cancer cells potentially via the down-regulation of matrix metalloproteinase-2. Eur J Nutr. 2014 Feb;53(1):345-50.

[3]. Brown NM, et al. The chemopreventive action of equol enantiomers in a chemically induced animal model of breast cancer. Carcinogenesis. 2010 May;31(5):886-93.

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