(-)-(S)-Equol

Cat. No.: HY-100583
CAS No.: 531-95-3
Molecular Formula: C₁₅H₁₄O₃
Molecular Weight: 242.27
Target: Estrogen Receptor/ERR; Endogenous Metabolite
Pathway: Others; Metabolic Enzyme/Protease
Storage: Powder
-20°C 3 years
4°C 2 years
In solvent
-80°C 6 months
-20°C 1 month

SOLVENT & SOLUBILITY

In Vitro

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

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Mass</th>
<th>1 mg</th>
<th>5 mg</th>
<th>10 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mM</td>
<td></td>
<td>4.1276 mL</td>
<td>20.6381 mL</td>
<td>41.2763 mL</td>
</tr>
<tr>
<td>5 mM</td>
<td></td>
<td>0.8255 mL</td>
<td>4.1276 mL</td>
<td>8.2553 mL</td>
</tr>
<tr>
<td>10 mM</td>
<td></td>
<td>0.4128 mL</td>
<td>2.0638 mL</td>
<td>4.1276 mL</td>
</tr>
</tbody>
</table>

Preparation of Stock Solutions

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; Need ultrasonic
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

(-)-(S)-Equol is a high affinity ligand for estrogen receptor β with a $K_i$ of 0.73 nM.

IC₅₀ & Target

Human Endogenous Metabolite

In Vitro

(-)-(S)-Equol shows the greatest affinity for ERβ ($K_i$=0.73±0.2 nM), whereas its affinity for ERα ($K_i$=6.41±1 nM) is relatively poor $^{[1]}$. (-)-(S)-Equol inhibits the growth of LnCaP, DU145 and PC3 human prostate cancer cell lines. (-)-(S)-Equol causes cell cycle arrest in the G2/M phase in PC3 cells by down regulating cyclin B1 and CDK1 and upregulating CDK inhibitors (p21 and p27),
as well as inducing apoptosis by upregulating Fas ligand (FasL) and the expression of pro-apoptotic Bim. (-)-(S)-Equol increases the expression of FOXO3a, decreases the expression of p-FOXO3a and enhances the nuclear stability of FOXO3a. (-)-(S)-Equol also decreases the expression of MDM2, which serves as an E3 ubiquitin ligase for p-FOXO3a, thus preventing p-FOXO3a degradation by the proteasome\(^2\). (-)-(S)-Equol enantioselectively increases the survival of INS-1 cells presumably through activating PKA signaling. (-)-(S)-Equol might have applications as an anti-type 2 diabetic agent. In INS-1 pancreatic \(\beta\)-cells, (-)-(S)-Equol induces phosphorylation of cAMP-response element-binding protein at Ser 133, and induced cAMP-response element-mediated transcription\(^3\).

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

| In Vivo | (-)-(S)-Equol inhibits the tumor growth by 43.2% and 28.4% compared to the control on day 33, suggesting that the compound is not overtly toxic\(^2\). MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

**PROTOCOL**

**Cell Assay**\(^2\)

PC3 cells are seeded in 96-well culture plates (about 5×10\(^3\) cells/ well) and cultured overnight at 37°C. Next, the cells are incubated with medium containing the indicated concentrations of (-)-(S)-Equol and/or DMSO for 72hr at 37°C. The cell viability is determined by the MTT assay\(^2\).

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**Animal Administration**\(^2\)

Mice: Mice are randomly divided into three groups of six mice each, and are treated by intragastric administration. The experimental groups are treated with 10 mg/kg or 20 mg/kg bodyweight of (-)-(S)-Equol (mice are treated everyday for 33 days). The control group is treated with an identical volume of 0.01ml sesame seed oil and 0.09 mL normal saline. The tumor size is examined every three days\(^2\).

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

**REFERENCES**

