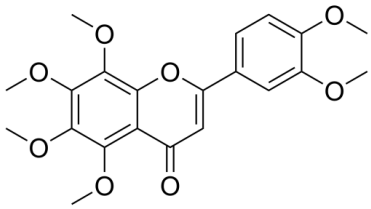
Data Sheet

Product Name:	Nobiletin
Cat. No.:	CS-5518
CAS No.:	478-01-3
Molecular Formula:	$C_{21}H_{22}O_8$
Molecular Weight:	402.39
Target:	Apoptosis; Autophagy; Reactive Oxygen Species; ROR
Pathway:	Apoptosis; Autophagy; Immunology/Inflammation; Metabolic Enzyme/Protease; NF-κB; Vitamin D Related/Nuclear Receptor
Solubility:	DMSO : 50 mg/mL (ultrasonic)



BIOLOGICAL ACTIVITY:

Nobiletin is a poly-methoxylated flavone from the citrus peel that improves memory loss. Nobiletin is a **retinoid acid receptor-related orphan receptors (RORs)** agonist. Nobiletin can reduce **reactive oxygen species (ROS)** levels in differentiated C2C12 myotubes and has anti-inflammation and anti-cancer properties, including anti-angiogenesis, anti-proliferation, anti-metastasis and induced **apoptosis**[1][2][3][4]. IC50 & Target:Retinoid acid receptor-related orphan receptors (RORs)[1]; reactive oxygen species (ROS)[1]; apoptosis[2] ***In Vitro:*** Nobiletin (0-100 μM; 24 hours; U2OS and HOS cells) treatment progressively reduces protein expressions of MMP-2 and MMP-9. In U2OS and HOS cells, Nobiletin considerably reduces the phosphorylation of p-IKKα/β and p-IκBα, and protein expression of NF-κB in the cell nuclear fraction with the concomitant increase of the NF-κB expression in the cytosolic fraction. Nobiletin down-regulates the p-CREB and the SP-1 expressions in the nuclear fraction, whereas Nobiletin does not affect c-Jun and c-Fos expressions[1].

Nobiletin (0-100 μM; 24 hours; U2OS and HOS cells) treatment significantly reduces mRNA expressions of MMP-2 and MMP-9 dose-dependently in U2OS and HOS cells[1]. ***In Vivo:*** Nobiletin (0.1% of regular diet; oral administration; daily; for 20 weeks; male C57BL/6 mice) treatment restores glucose homeostasis and promots energy expenditure and circadian activity in aged mice[2].

PROTOCOL (Extracted from published papers and Only for reference)

Cell Assay [3] To evaluate the cytotoxicity of nobiletin, a MTT [3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyl-tetrazolium bromide] assay was performed to determine the cell viability. Briefly, U2OS and HOS cells were seeded at a density of 8×104 per well in a 24-well, and MC3T3-E1 cells were seeded at a density of 105 per well in a 96-well plate for 16 h. Then, cells were treated with nobiletin at indicated concentrations (0, 25, 50, 75, 100 μM) for additional 24 h. Each concentration was repeated three times. After the exposure period, the medium was removed and followed by washing the cells with PBS. Then, the medium was changed and incubated with MTT solution (0.5 mg/ml) (Sigma, St. Louis, MO, USA) for 4 h. After removing the medium, the viable cell number per dish was directly proportional to the production of formazan which was solubilized in isopropanol and measured spectrophotometrically at 563 nm. The percentage of viable cells was estimated by comparing with the untreated control cells.

References:

[1]. Cheng HL, et al. Nobiletin inhibits human osteosarcoma cells metastasis by blocking ERK and JNK-mediated MMPs expression. Oncotarget. 2016 Jun 7;7(23):35208-23.

[2]. Nohara K, et al. Nobiletin fortifies mitochondrial respiration in skeletal muscle to promote healthy aging against metabolic challenge. Nat Commun. 2019 Aug 28;10(1):3923.

[3]. He B, et al. The Small Molecule Nobiletin Targets the Molecular Oscillator to Enhance Circadian Rhythms and Protect against Metabolic Syndrome. Cell Metab. 2016 Apr 12;23(4):610-21.

[4]. Takito J, et al. Nerve growth factor enhances the CRE-dependent transcriptional activity activated by nobiletin in PC12 cells. Can J Physiol Pharmacol. 2016 Jul;94(7):728-33.

CAIndexNames:

4H-1-Benzopyran-4-one, 2-(3,4-dimethoxyphenyl)-5,6,7,8-tetramethoxy-

SMILES:

O=C1C=C(C2=CC=C(OC)C(OC)=C2)OC3=C(OC)C(OC)=C(OC)C(OC)=C13

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