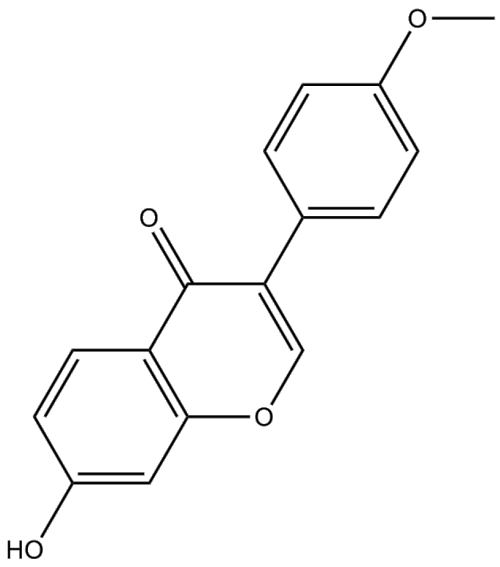
Product Data Sheet

Product Name: Formononetin
Cat. No.: GN10527

Chemical Properties

Cas. No.	485-72-3		
Chemical Name	7-hydroxy-3-(4-methoxyphenyl)chromen-4-one		
SMILES	COC1=CC=C(C=C1)C2=COC3=C(C2=O)C=CC(=C3)O		
Formula	$C_{16}H_{12}O_4$	M.Wt	268.27
Solubility	DMF: 30 mg/ml,DMF:PBS(pH 7.2) (1:1): 0.5 mg/ml,DMSO: 25 mg/ml	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		

Structure



Protocol

Cell experiment [1]:

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Cell lines	The Ishikawa, HEC-1A, and HEC-251 cell lines
Preparation Method	The effect of Formononetin on the colony-forming ability of endometrial cancer cells was evaluated by colony formation assay. The Ishikawa, HEC-1A, and HEC-251 cell lines were seeded into 6-well plates at the concentration of 400 cells per well. After incubating for 24h at 37°C, the cells were incubated with Formononetin (40μM and 80μM). Three days later, most single colonies contain more than 50 cells. Cells were harvested and rinsed three times with distilled water, and images were obtained by a microscope.
Reaction Conditions	10, 80μM; 3d
Applications	Formononetin inhibit Ishikawa, HEC-1A, and HEC-251 cells proliferation in a dose-dependent manner.

Animal experiment [2]:

Animal models	Hyperoxic acute lung injury Modle
Preparation Method	Before the experiment, mice were housed in closed and individually ventilated cages under a 12h light:dark cycle for at least 1 week to acclimate to the environment. Mice had ad libitum access to standard chow and water. Mice were divided into a control group (room air+vehicle) and four other groups (room air+Formononetin, hyperoxia+vehicle, hyperoxia+Formononetin, and zinc protoporphyrin (ZnPP, an inhibitor of HO-1)+hyperoxia+Formononetin). To induce hyperoxic acute lung injury, mice were housed in closed cages and exposed to hyperoxia (>95% oxygen) for 72h. Room air exposure served as a control.
Dosage form	10, 100mg/kg; ip; 72h

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Applications	Formononetin pretreatment notably attenuated hyperoxia-induced elevating pulmonary water content, upregulation of proinflammatory cytokine levels and increasing infiltration of neutrophil in the lung.

References:
[1]. Zhang Q, Huang X. The modulatory properties of Astragalus membranaceus treatment on endometrial cancer: an integrated pharmacological method[J]. PeerJ, 2021, 9: e11995.
[2]. Chen Y, Wei D, Zhao J, et al. Reduction of hyperoxic acute lung injury in mice by Formononetin[J]. PloS one, 2021, 16(1): e0245050.

Background

Formononetin is a potent FGFR2 inhibitor with an IC_{50} of 4.3μM. Formononetin potently inhibits angiogenesis and tumor growth[1].

Formononetin (10, 80μM; 3d) inhibit Ishikawa, HEC-1A, and HEC-251 cells proliferation in a dose-dependent manner[2]. Formononetin (10, 25μM; 24h) is a potent protectant against cisplatin-induced cell death through inhibiting intracellular ROS accumulation in pig kidney epithelial LLC-PK1 cells[3]. Formononetin (0.1, 0.3, 1μM; 30-60min) increased CNE2 cell estrogen receptor-α (ERα) and bcl-2, but decreased protein-phosphatase and tensin homologue (PTEN) protein expression[4].

In mice hyperoxic acute lung injury, Formononetin (10, 100 mg/kg; ip; 72h) significantly attenuated hyperoxia-induced elevated lung water content, up-regulation of pro-inflammatory cytokine levels, and increased lung neutrophil infiltration[5]. In mice acute ischaemic injury model, formononetin (20mg/kg; po; 28d) promoted the expression of ER β and p53 in a dose-dependent manner[6].

References:
[1] Wu X Y, Xu H, Wu Z F, et al. Formononetin, a novel FGFR2 inhibitor, potently inhibits angiogenesis and tumor growth in preclinical models[J]. Oncotarget, 2015, 6(42): 44563.
[2]. Zhang Q, Huang X. The modulatory properties of Astragalus membranaceus treatment on endometrial cancer: an integrated pharmacological method[J]. PeerJ, 2021, 9: e11995.
[3] Lee H, Lee D, Kang K S, et al. Inhibition of intracellular ROS accumulation by Formononetin attenuates cisplatin-mediated apoptosis in LLC-PK1 cells[J]. International journal of molecular

sciences, 2018, 19(3): 813.
[4] Guo Y H, Tang F Y, Wang Y, et al. Low concentration of Formononetin promotes proliferation of estrogen receptor-positive cells through an ERα-miR-375-PTEN-ERK1/2-bcl-2 pathway[J]. Oncotarget, 2017, 8(59): 100045.
[5]Chen Y, Wei D, Zhao J, et al. Reduction of hyperoxic acute lung injury in mice by Formononetin[J]. PloS one, 2021, 16(1): e0245050.
[6] Zhao L, Han J, Liu J, et al. A novel Formononetin derivative promotes anti-ischemic effects on acute ischemic injury in mice[J]. Frontiers in Microbiology, 2021, 12: 786464.

Caution: Product has not been fully validated for medical applications. For research use only.
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