4-Methylumbelliferone

Cat. No.: HY-N0187

CAS No.: 90-33-5

Molecular Formula: $C_{10}H_8O_3$

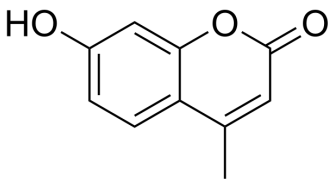
Molecular Weight: 176.17

Target: Others

Pathway: Others

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	1 year
	-20°C	6 months



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (567.63 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	5.6763 mL	28.3817 mL	56.7634 mL
5 mM	1.1353 mL	5.6763 mL	11.3527 mL
10 mM	0.5676 mL	2.8382 mL	5.6763 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 50% PEG300 >> 50% saline
   Solubility: 50 mg/mL (283.82 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (14.19 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (14.19 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (14.19 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

4-Methylumbelliferone is a hyaluronic acid biosynthesis inhibitor with antitumoral and antimetastatic effects.

IC_{50} & Target

hyaluronic acid[1]

In Vitro

4-Methylumbelliferone (4-MU) affects several key steps of angiogenesis, including endothelial cell proliferation, adhesion,

tube formation, and extracellular matrix remodeling. Half-maximal inhibitory concentrations (IC_{50}) values in the proliferation assay are 0.65±0.04 and 0.37±0.03 mM for human microvascular endothelial cells (HMEC) and RF-24 endothelial cells, respectively. 4-Methylumbelliferone (2 mM) treatment for 24 h induces apoptosis in 13% of HMEC and 5% of RF-24 cells. The number of adherent endothelial cells decreases by >20% after 24 h of treatment with 1 mM 4-Methylumbelliferone. Minimal inhibitory concentrations in the tube formation assay are 2 and 0.5 mM 4-Methylumbelliferone for HMEC and RF-24, respectively. Matrix metalloproteinase-2 expression is differentially altered upon 4-Methylumbelliferone treatment in both tested endothelial cell lines[1].

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

PROTOCOL

Cell Assay [1]

The MTT dye reduction assay in 96-well microplates is used. The assay is dependent on the reduction of MTT by mitochondrial dehydrogenases of viable cells to a blue formazan product, which can be measured spectrophotometrically. Endothelial cells (2.5×10^3 cells in a total volume of 100 µL of complete medium) are incubated in each well with serial dilutions of 4-Methylumbelliferone (4-MU) (0, 0.5, 1, 1.5 and 2 mM). After 3 days of incubation in the dark (37°C, 5% CO_2 in a humid atmosphere), 10 µL of MTT (5 mg/mL in PBS) is added to each well, and the plate is incubated for further a 4 h (37°C). The formazan is dissolved in 150 µL of 0.04 N HCl-2 propanol, and samples are spectrophotometrically measured at 550 nm. All determinations are carried out in quadruplicate, and at least three independent experiments are carried out. IC_{50} values are calculated as those concentrations of compound yielding 50% cell survival, taking the values obtained for control as 100%[1].

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

CUSTOMER VALIDATION

- Cell Rep. 2024 Feb 16;43(2):113808.
- Int J Biol Macromol. 2022 Oct 6;S0141-8130(22)02246-2.

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REFERENCES

[1]. García-Vilas JA, et al. 4-methylumbelliferone inhibits angiogenesis in vitro and in vivo. J Agric Food Chem. 2013 May 1;61(17):4063-71.

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