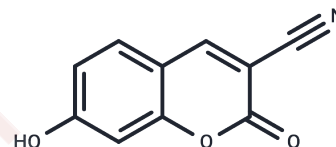


3-Cyano-7-hydroxycoumarin

Chemical Properties

CAS No. :	19088-73-4
Formula:	C ₁₀ H ₅ NO ₃
Molecular Weight:	187.15
Storage:	Powder: -20°C for 3 years In solvent: -80°C for 1 year Actual storage temperature shall be subject to the COA.



Biological Description

Description	3-Cyano-7-hydroxycoumarin (3-Cyanoumbelliferone) is a macrophage inhibitor of macrophage inhibitory factor (MIF) interconjugate isomerase with a K_i of 2.9 μM . 3-Cyano-7-hydroxycoumarin belongs to the group of coumarin derivatives, which can be used as molecular probes and fluorescent dyes.
Targets(IC50)	Others,MIF
In vitro	<p>Instructions</p> <p>I. Solution preparation</p> <p>1. Preparation of mother solution and working solution: It can be dissolved in DMSO and further diluted to aqueous buffer solution as working solution in the experiment.</p> <p>II. Operation steps</p> <p>1. Sample preparation</p> <p>Target molecule: This probe is mainly used to detect MIF activity, or as a general fluorescent dye. It can be used to study the role of MIF in inflammation, cancer and immune response.</p> <p>Concentration: For fluorescence experiments, a solution with a concentration of 1–10 μM is usually used, and the specific concentration is adjusted according to the sensitivity and requirements of the experiment.</p> <p>2. Experimental conditions</p> <p>1) Buffer selection: In order to study MIF inhibition, it is recommended to select a suitable buffer (such as phosphate buffer with a pH range of 7.0–7.5) to simulate physiological conditions.</p> <p>2) Add 3-Cyano-7-hydroxycoumarin: Add an appropriate amount of 3-Cyano-7-hydroxycoumarin solution (usually 0.1–1 mM) to the sample.</p> <p>3) Reaction temperature and time: Typically, the reaction temperature is room temperature to 37°C. The reaction time depends on the activity of the enzyme in the sample and is usually between 30 minutes and 1 hour.</p> <p>4) Hydrogen peroxide (H_2O_2) is usually added as an oxidant to initiate the reaction.</p> <p>5) Color change: After the reaction is completed, the product is usually brown or dark in color and can be quantitatively detected using colorimetric methods (such as UV-Vis spectrophotometer).</p> <p>3. Fluorescence imaging</p> <p>3-Cyano-7-hydroxycoumarin can be used as a fluorescent probe to track molecular interactions or the activity of biomolecules such as MIF in live cell imaging.</p> <p>Detection: Fluorescence intensity is quantified by fluorescence microplate reader,</p>

In vitro	<p>confocal microscopy or flow cytometry.</p> <p>4. Inhibition assay</p> <p>For MIF tautomerase inhibition assay, 3-Cyano-7-hydroxycoumarin can be used to determine its inhibitory potency with a K_i value of 2.9 μM.</p> <p>Methods: The inhibition of MIF by 3-Cyano-7-hydroxycoumarin was evaluated by measuring the fluorescence quenching effect.</p> <p>Storage conditions</p> <p>1) 3-Cyano-7-hydroxycoumarin should be stored in a dry, cool place at -20°C, away from light and moisture.</p> <p>2) The solution should be freshly prepared and, if storage is required, should be stored at -20°C or below and away from light.</p> <p>The above information is based on published literature. Experimental procedures should be appropriately modified to meet specific research demands.</p>
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Solubility Information

Solubility	DMSO: 15 mg/mL (80.15 mM), Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
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Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	5.3433 mL	26.7165 mL	53.4331 mL
5 mM	1.0687 mL	5.3433 mL	10.6866 mL
10 mM	0.5343 mL	2.6717 mL	5.3433 mL
50 mM	0.1069 mL	0.5343 mL	1.0687 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

- Xiao Z, et al. 7-Hydroxycoumarins Are Affinity-Based Fluorescent Probes for Competitive Binding Studies of Macrophage Migration Inhibitory Factor. *J Med Chem.* 2020 Oct 22;63(20):11920-11933.
- Shivraj, et al. A combined spectroscopic and TDDFT investigation of the solute-solvent interactions of two coumarin derivatives. *Luminescence.* 2017 Nov;32(7):1328-1338.
- White IN. A continuous fluorometric assay for cytochrome P-450-dependent mixed function oxidases using 3-cyano-7-ethoxycoumarin. *Anal Biochem.* 1988 Aug 1;172(2):304-10.

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Tel: 781-999-4286 E_mail: info@targetmol.com Address: 34 Washington Street, Wellesley Hills, MA 02481