

Product Data Sheet

Product Name: 3-Nitrocoumarin

Cat. No.: GC65595

Chemical Properties

Cas. No. 28448-04-6

Formula C₉H₅NO₄

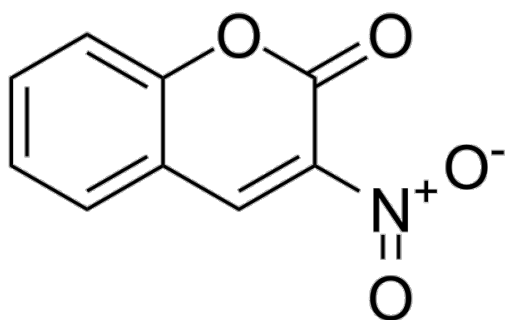
M.Wt 191.14

Solubility DMSO : ≥ 100 mg/mL (523.18 mM) 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]:

Cell lines Huh-7 and RFP/PLC/5 non-cancer stem cells (NCSCs)

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

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Preparation Method Cells were cultured in DMEM/F12 media with penicillin, streptomycin, B27 supplement, 20ng/mL of epidermal growth factor, 20ng/mL of basic FGF, and 5U/mL of insulin. Cells were pre-treated with 3-Nitrocoumarin (20μM) for 2 hours.

Reaction Conditions 20μM; pretreatment for 2 hours

Applications 3-Nitrocoumarin attenuated FGF19-dependent store-operated Ca^{2+} entry (SOCE) activation in Huh-7 and RFP/PLC/5 NCSCs. 3-Nitrocoumarin also inhibited the aggregation of stromal interaction molecule 1 (STIM1) induced by FGF19 stimulation. 3-Nitrocoumarin suppressed FGF19-induced nuclear translocation of nuclear factor of activated T cells c2 (NFATc2).

References:

[1] Wang J, Zhao H, Zheng L, et al. FGF19/SOCE/NFATc2 signaling circuit facilitates the self-renewal of liver cancer stem cells. *Theranostics*. 2021 Mar 5;11(10):5045-5060.

Background

3-Nitrocoumarin is an effective and selective phospholipase C-γ (PLC-γ) inhibitor. 3-Nitrocoumarin can affect calcium signaling pathways by inhibiting PLC-γ activity and blocking inositol trisphosphate (IP3) generation. 3-Nitrocoumarin can be used for intracellular signaling mechanism research and photochemical applications^[1-4].

In vitro, Huh-7 and RFP/PLC/5 NCSCs cells were pretreated with 3-Nitrocoumarin (20μM) for 2 hours, followed by stimulation with FGF19 for 4 hours. 3-Nitrocoumarin inhibited FGF19-dependent SOCE activation, suppressed FGF19-induced STIM1 aggregation, and prevented NFATc2 nuclear translocation^[5]. 3-Nitrocoumarin (0-600μM) was used to treat Caco-2 monolayer cells for 60 minutes. 3-Nitrocoumarin significantly increased the apparent permeability coefficient of mannitol and reduced the transepithelial electrical resistance of the cells^[6].

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References:

- [1] Tisi R, Baldassa S, Belotti F, et al. Phospholipase C is required for glucose-induced calcium influx in budding yeast. *FEBS Lett.* 2002 Jun 5;520(1-3):133-8.
- [2] Silverman-Gavrila LB, Lew RR. An IP3-activated Ca²⁺ channel regulates fungal tip growth. *J Cell Sci.* 2002 Dec 15;115(Pt 24):5013-25.
- [3] Wang Y, Peng D, Zhang X, et al. PLCβ4 driven by cadmium-exposure during gestation and lactation contributes to cognitive deficits by suppressing PIP2/PLCγ1/CREB/BDNF signaling pathway in male offspring. *J Hazard Mater.* 2024 Aug 5;474:134756.
- [4] Ward PD, Klein RR, Troutman MD, et al. Phospholipase C-gamma modulates epithelial tight junction permeability through hyperphosphorylation of tight junction proteins. *J Biol Chem.* 2002 Sep 20;277(38):35760-5.
- [5] Wang J, Zhao H, Zheng L, et al. FGF19/SOCE/NFATc2 signaling circuit facilitates the self-renewal of liver cancer stem cells. *Theranostics.* 2021 Mar 5;11(10):5045-5060.
- [6] Tippin TK, Thakker DR. Biorelevant refinement of the Caco-2 cell culture model to assess efficacy of paracellular permeability enhancers. *J Pharm Sci.* 2008 May;97(5):1977-92.

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