

Product Data Sheet

Product Name: NCOA4 - 9a

Cat. No.: GC26219

Chemical Properties

Cas. No. 2650557-72-3

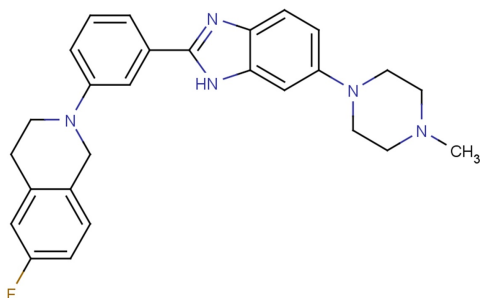
Formula $C_{27}H_{28}FN_5$ M.Wt 441.54

Solubility DMSO: 40mg/mL, Need ultrasonic; Storage Store at -20°C
Insoluble in water

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 Human periodontal ligament stem cells (hPDLs)

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Preparation Method hPDLCs were seeded at a density of 1×10^5 cells per well in a 6-well plate and cultured until the cell confluence reached 80%. To apply compressive force to the hPDLCs, a layer of glass sheet was placed on the cells, and a container with metal balls containing heavy metals was used to adjust the compressive force by changing the number of metal balls. Additionally, at a compressive force of 2g/cm^2 , 20ng/ml of IL-1 β was added to the hPDLCs for 24 hours, and NCOA4 - 9a (0.5 μM) was used for treatment simultaneously. Then, cell viability was analyzed.

Reaction Conditions 0.5 μM ; 24h

Applications NCOA4 - 9a treatment reversed the phenomenon that cell viability of hPDLCs significantly decreased under the stimulation of CF and IL-1 β .

Animal experiment [2]:

Animal models Male Sprague-Dawley (SD) rats

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Male Sprague-Dawley (SD) rats weighing 180-220g were housed individually under standard conditions of temperature and humidity, and a 12h light-dark cycle, with free access to food and water. Rats were anesthetized with intraperitoneal injection of phenobarbital (60mg/kg). The left common carotid artery and external carotid artery were separated and ligated through a median cervical incision, and the pterygofrontal artery was separated as well. An arterial clamp was placed in the proximal and distal carotid arteries, and a 4-0 monofilament nylon suture was inserted through the incision, to a depth of 17-20mm. The filament was withdrawn to restore blood flow (reperfusion) after 1.5h of middle cerebral artery occlusion (MCAO). All the SD rats subjected to MCAO were randomly divided into four groups (n=18 per group). Vehicle, Fer-1 (10mg/kg), or NCOA4 - 9a (10mg/kg) was administered by intraperitoneal injection 0.5h before and 2h after MCAO occlusion. All the sham-operated control rats were performed the same surgical procedure without insertion of a filament. Collect brain tissue for analysis.

Dosage form 10mg/kg for twice; i.p.

Applications NCOA4 - 9a treatment alleviate cerebral ischemic injury in rats and reduce the levels of malondialdehyde (MDA) and 4-hydroxynonenal (4-HNE).

References:

- [1] Liu L, Li D, Zhou Z, et al. Inhibition of NCOA4/FTH1-mediated ferritinophagy attenuates ferroptosis in PDLs and alleviates orthodontically induced inflammatory root resorption[J]. Progress in Orthodontics, 2025, 26(1): 43.
- [2] Fang Y, Chen X, Tan Q, et al. Inhibiting ferroptosis through disrupting the NCOA4–FTH1 interaction: a new mechanism of action[J]. ACS central science, 2021, 7(6): 980-989.

Background

NCOA4 - 9a is an inhibitor of ferritinophagy that inhibits erastin-induced ferroptosis, with an EC₅₀ value of 0.29μM^[1]. NCOA4 - 9a blocks ferroptosis by reducing the amount of bioavailable

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intracellular ferrous iron through disrupting the NCOA4–FTH1 protein–protein interaction^[2]. NCOA4 - 9a is widely used to interfere with the ferritin autophagy process, reduce the release of iron ions, and delay the neuronal death in the rat hippocampus^[3].

In vitro, NCOA4 - 9a treatment (0.5μM) for 36 hours significantly reversed the upregulation of lipid ROS levels in HCT-116 cells induced by sodium butyrate (NaB)^[4]. 10μM NCOA4 - 9a treatment for 4 hours significantly increased the expression of FTH1 protein in the goat sperm model of cryopreservation and enhanced sperm survival^[5]. NCOA4 - 9a treatment (0.5μM; 24h) reversed the cell death of human periodontal ligament cells (hPDLCs) significantly decreased under the stimulation of compressive force (CF) and IL-1β^[6]. NCOA4 - 9a pretreatment for 2 hours (2.5μM) reduced the expression of the NP protein of PR8 H1N1 virus in A549 cells and inhibited the replication of PR8 H1N1 virus^[7].

In vivo, NCOA4 - 9a treatment via daily intraperitoneal injection (10mg/kg) for 5 consecutive days significantly inhibited the growth of leukemia tumors in the murine patient-derived xenograft (PDX) models of acute myeloid leukemia (AML), without affecting the body weight of the mice^[8].

References:

- [1] Fang Y, Chen X, Tan Q, et al. Inhibiting ferroptosis through disrupting the NCOA4–FTH1 interaction: a new mechanism of action[J]. ACS central science, 2021, 7(6): 980-989.
- [2] Larrue C, Mouche S, Angelino P, et al. Ferritinophagy Is a Druggable Vulnerability of Quiescent Leukemic Stem Cells[J]. Blood, 2023, 142: 407.
- [3] Chen J, Yan L, Zhang Y, et al. Maternal exposure to nanopolystyrene induces neurotoxicity in offspring through P53-mediated ferritinophagy and ferroptosis in the rat hippocampus[J]. Journal of Nanobiotechnology, 2024, 22(1): 651.
- [4] Liu L, Liu Y, Zhou X, et al. Sodium butyrate induces ferroptosis in colorectal cancer cells by promoting NCOA4-FTH1-mediated ferritinophagy[J]. International Immunopharmacology, 2025, 163: 115188.
- [5] Hai E, Li B, Song Y, et al. Superoxide anion-induced ferritinophagy is involved in ferroptosis occurrence of cashmere goat sperm during cryopreservation[J]. Journal of Integrative Agriculture, 2025.
- [6] Liu L, Li D, Zhou Z, et al. Inhibition of NCOA4/FTH1-mediated ferritinophagy attenuates ferroptosis in PDLCs and alleviates orthodontically induced inflammatory root resorption[J]. Progress

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in Orthodontics, 2025, 26(1): 43.

[7] Ouyang A, Chen T, Feng Y, et al. The hemagglutinin of influenza A virus induces ferroptosis to facilitate viral replication[J]. Advanced Science, 2024, 11(39): 2404365.

[8] Larrue C, Mouche S, Angelino P, et al. Targeting ferritinophagy impairs quiescent cancer stem cells in acute myeloid leukemia in vitro and in vivo models[J]. Science Translational Medicine, 2024, 16(757): eadk1731.

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