Product Data Sheet

Chemical Properties

Product Name: Nocodazole
Cas No.: 31430-18-9
M.Wt: 301.32
Formula: C14H11N3O3S
Synonyms: N/A

Chemical Name: methyl N-[6-(thiophene-2-carbonyl)-1H-benzimidazol-2-yl]carbamate
Canonical SMILES: COC(=O)NC1=NC2=C(N1)C=C(C2)C(=O)C3=CC=CS3
Solubility: $\geq 15.1$ mg/mL in DMSO
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.
Shopping Condition: Evaluation sample solution: ship with blue ice
All other available size: ship with RT, or blue ice upon request

Biological Activity

Targets: Ubiquitination/Proteasome
Pathways: Autophagy

Description:

Nocodazole, an anti-mitotic drug, is a rapidly-reversible inhibitor of microtubule polymerization which inhibits Abl, Abl(E255K) and Abl(T315I) with the IC50 value of 0.21 μM, 0.53 μM and 0.64 μM in cell-free assays, respectively[1].
In vitro: Nocodazole was a high-affinity ligand for the cancer-related kinases including Abl
phosphorylated, c-Kit, BRAF, and MEK with the Kd values of 0.091 μM, 1.6 μM, 1.8 μM and 1.6 μM, respectively. In addition, the Kd for Abl(E255K) phosphorylated, Abl(T315I) phosphorylated, BRAF(V600E) and PI3Kγ was 0.12 μM, 0.17 μM, 1.1 μM and 1.5 μM, respectively. In chronic lymphocytic leukemia cells, Nocodazole induced apoptosis. In some human colon carcinoma cells, Nocodazole decrease D apoptosis. Also, Nocodazole inhibited insulin-stimulated glucose transport. Nocodazole impaired the morphology and directionality of migrating medial gan-gliaonic eminence cells [1]. At high concentrations, Nocodazole rapidly depolymerized microtubules in cells, while low concentrations of Nocodazole inhibited microtubule dynamic instability [2]. In SH-SY5Y cells, Nocodazole disrupted microtubules by binding to β-tubulin, prevented the formation of one of the two interchain disulfide linkages and impaired the transport of vesicles. Nocodazole significantly attenuated METH-induced cell death and lysosomal dysfunction [3]. Nocodazole (≥ 50 nM) resulted in a rapid reduction in fibroblast locomotion to a new rate that was maintained for > 2 hours. Nocodazole(100 nM) decreased the rate of locomotion by more than 60%; and 300 nM nocodazole completely stopped cell locomotion[4].

In vivo: In athymic mice bearing COLO 205 tumor xenografts, after 6 wk of treatment with Ketoconazole (50 mg/kg/three times per week) plus Nocodazole (5 mg/kg/three times per week), the antitumor effects of ND were significantly potentiated by KT. The tumor volume and tumor weight of the mice are significantly reduced as compared with those treated with Ketoconazole or Nocodazole alone. Nocodazole treatment in combination with Ketoconazole strongly enhanced apoptosis of COLO 205 tumor xenografts treated with Ketoconazole or Nocodazole alone [5].

Reference:

Protocol

Cell experiment:

Cell lines
SH-SY5Y cells, NRK fibroblasts

Preparation method
The solubility of this compound in DMSO is >15.1mg/mL. General tips for obtaining a higher concentration: Please warm the tube at
37 °C for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Reacting conditions

Applications
In SH-SY5Y cells, Nocodazole (1 μM) disrupted microtubules by binding to β-tubulin, prevented the formation of one of the two interchain disulfide linkages and impaired the transport of vesicles. Nocodazole significantly attenuated METH-induced cell death and lysosomal dysfunction. Nocodazole (400 nM) completely inhibited cell locomotion that was maintained throughout the nocodazole treatment (>2 hours). Nocodazole treatment resulted in a dose-dependent decrease in the rate of locomotion. Nocodazole (25 nM, 100 nM) significantly inhibited cell locomotion.

Animal experiment [3]:

Animal models
Athymic mice bearing COLO 205 tumor xenografts

Dosage form
5 mg/kg/three times per week

Applications
The antitumor effects of nocodazole were significantly potentiated by ketoconazole in mice after 6 wk of treatment. No gross signs of toxicity were observed in mice receiving these treatments.

Other notes
Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

Reference:

Product Citations
Caution

FOR RESEARCH PURPOSES ONLY.

NOT FOR HUMAN, VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

Specific storage and handling information for each product is indicated on the product datasheet. Most ApexBio products are stable under the recommended conditions. Products are sometimes shipped at a temperature that differs from the recommended storage temperature. Shortterm storage of many products are stable in the short-term at temperatures that differ from that required for long-term storage. We ensure that the product is shipped under conditions that will maintain the quality of the reagents. Upon receipt of the product, follow the storage recommendations on the product data sheet.