Data Sheet (Cat.No.TQ0211)

TargetMol

Brusatol

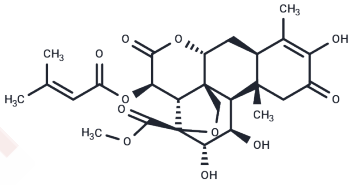
Chemical Properties

CAS No. : 14907-98-3

Formula: C26H32O11

Molecular Weight: 520.53

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	Brusatol (NSC-172924) is a natural product isolated from the Brucea javanica plant. It inhibits Nrf2.
Targets(IC50)	Apoptosis,Ferroptosis,Nrf2
In vitro	Brusatol provokes the depletion of Nrf2 via a mechanism that is not dependent on Keap1 and the proteasomal and autophagic protein degradation systems. Brusatol provokes a rapid and transient depletion of Nrf2 protein, through a posttranscriptional mechanism, in mouse Hepa-1c1c7 hepatoma cells. Brusatol also inhibits Nrf2 in freshly isolated primary human hepatocytes [1]. CT-26 cells are treated with various concentrations of Brusatol (0.05, 0.15, 0.45, 1.35, 4.05 and 12.15 μg/mL) and CDDP (0.05, 0.15, 0.45, 1.35, 4.05 and 12.15 μg/mL) for 48 h, either alone or in combination. Following treatment with Brusatol and CDDP for 48 h, the viability of CT-26 cells is reduced in a dose-dependent manner, with IC50 values of 0.27±0.01 and 1.44±0.22 μg/mL, respectively. When Brusatol is combined with CDDP at a constant concentration ratio of 1:1, cell growth inhibition is markedly enhanced compared with single-agent treatment; the IC50 value of Brusatol and CDDP cotreatment is 0.19±0.02 μg/mL [2].
In vivo	Nude mice are injected with A549 cells to induce tumor growth, followed by a single i.p. injection of 2 mg/kg Brusatol. Tumors are isolated 24 h or 48 h postinjection. Nrf2 protein levels are significantly decreased at 24 h or 48 h postinjection, indicating that Brusatol is able to reach the tumor tissue and inhibit the Nrf2 pathway. In the first experiment, once the tumor size reaches an average of 230 mm3, DMSO, Brusatol (2 mg/kg), Cisplatin (2 mg/kg), or Cisplatin (2 mg/kg) and Brusatol (2 mg/kg) combined treatment is i.p. injected every other day for a total of five times. Cisplatin or Brusatol alone does not inhibit tumor growth significantly, whereas, in the combination group, tumor size is significantly reduced [3].
Cell Research	CT-26 cells in logarithmic growth are seeded onto a 96-well plate at a density of 4×10^3 cells/well. After 24 h of incubation at 37°C, fresh medium containing a series of concentrations of Brusatol (0.05, 0.15, 0.45, 1.35, 4.05 and 12.15 μg/mL) and CDDP (0.05, 0.15, 0.45, 1.35, 4.05 and 12.15 μg/mL) is added at 100 μL/well; each concentration is used to treat six replicate wells. After 48 h of incubation at 37°C, the cells are further incubated with MTT (10 mg/mL) at 37°C for 4 h. The supernatant is then removed and the precipitate is dissolved with 100 μL DMSO. Absorbance is measured using a microplate reader at a wavelength of 490 nm. Cytotoxicity is expressed as the

Cell Research	concentration of Brusatol and CDDP that inhibit cell growth by 50% (IC50 value). The inhibitory rate is calculated. The possible synergistic effect of Brusatol combined with CDDP is investigated by exposing CT-26 cells to various concentrations of each agent alone or in combination for 48 h [2].
Animal Research	Athymic nude mice are used. Mice 4-6 wk old are injected with A549 cells. Once the tumors reached 80 mm3 (for the two times five-time Cisplatin treatment regimen) or 280 mm3 (for the single five-time Cisplatin treatment regime), mice are randomly allocated into four groups and treated i.p. with DMSO, Cisplatin (2 mg/kg), Brusatol (2 mg/kg), or in combination every other day for a total of five times. After the initial five-time Cisplatin treatment regimen, treatment stops for 1 wk to allow mice to recover before the second five-time Cisplatin treatment regimen is repeated [3].

Solubility Information

Solubility	H2O: Insoluble, DMSO: 240 mg/mL (461.07 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 5 mg/mL (9.61 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.9211 mL	9.6056 mL	19.2112 mL
5 mM	0.3842 mL	1.9211 mL	3.8422 mL
10 mM	0.1921 mL	0.9606 mL	1.9211 mL
50 mM	0.0384 mL	0.1921 mL	0.3842 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

Olayanju A, et al. Brusatol provokes a rapid and transient inhibition of Nrf2 signaling and sensitizes mammaliancells to chemical toxicity-implications for therapeutic targeting of Nrf2. Free Radic Biol Med. 2015 Jan; 78:202-12.

Wang Y, Ma H, Huang J, et al. Discovery of bardoxolone derivatives as novel orally active necroptosis inhibitors. European Journal of Medicinal Chemistry,. 2021 Feb 15;212:113030

Li J, Hao M, Liu M, et al. Transcutaneous Electrical Acupoint Stimulation Pretreatment Alleviates Cerebral Ischemia-Reperfusion Injury in Rats by Modulating Microglia Polarization and Neuroinflammation Through Nrf2/HO-1 Signaling Pathway. Neurochemical Research. 2022: 1-12.

Chen HM, et al. Synergistic antitumor effect of Brusatol combined with Cisplatin on colorectal cancer cells. Int J Mol Med. 2018 Mar;41(3):1447-1454.

Ren D, et al. Brusatol enhances the efficacy of chemotherapy by inhibiting the Nrf2-mediated defense mechanism. Proc Natl Acad Sci U S A. 2011 Jan 25;108(4):1433-8.

Zhu X, Huang N, Ji Y, et al.Brusatol induces ferroptosis in oesophageal squamous cell carcinoma by repressing GSH synthesis and increasing the labile iron pool via inhibition of the NRF2 pathway.Biomedicine & Pharmacotherapy.2023, 167: 115567.

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Wang Y, Ma H, Huang J, et al. Discovery of bardoxolone derivatives as novel orally active necroptosis inhibitors[J]. European Journal of Medicinal Chemistry. 2020: 113030.