

Product Data Sheet

Product Name: Vinblastine sulfate

Cat. No.: GC12286

Chemical Properties

Cas. No. 143-67-9

SMILES CCC1(CC2CC(C3=C(CCN(C2)C1)C4=CC=CC=C4N3)(C5=C(C=C6C(=C5)C78CCN9C7C(C=CC9)(C(C(C8N6C)(C(=O)OC)O)OC(=O)C)CC)OC)C(=O)OC)O.OS(=O)(=O)O

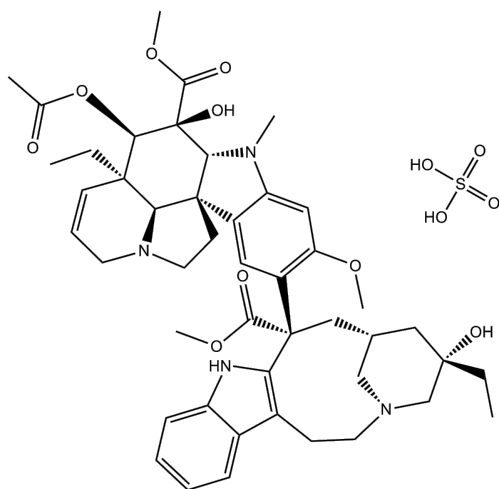
Formula $C_{46}H_{60}N_4O_{13}S$ M.Wt 909.05

Solubility ≥ 28.85 mg/mL in DMSO, ≥ 48.2 mg/mL in Water with ultrasonic Storage 4°C , protect from light

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]:

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Cell lines Human acute promyelocytic leukaemia (NB4) cells

For all experiments, the cells were seeded in 12 well culture plates in regular culture medium at a density of 5×10^5 cells/mL. Stock solutions of Vinblastine sulfate were prepared by dilution in dimethyl sulfoxide (DMSO). Cells were treated with different concentrations of Vinblastine sulfate for different times in Preparation Method culture medium. Each of the used reagents was diluted with culture medium to the desired concentration with a final DMSO concentration of 0.1%. DMSO was added to untreated cultures at 0.1% (v/v) as a solvent control. NB4 cells were treated with 50 μ M Vinblastine sulfate for 19h. All the treatments were performed at 37°C in 5% CO₂.

Reaction
Conditions 50 μ M; 19h

Applications Vinblastine sulfate reduced NB4 cell viability in a time- and concentration-dependent manner and concurrently promoted apoptosis and cell cycle arrest.

Animal experiment [2]:

Animal models Fibrosarcoma mouse model

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Preparation Method	For studying the influence of Vinblastine sulfate on radiation-induced DNA strand breaks, a serially transplanted fibrosarcoma originally developed by subcutaneous injection of 6,12-dimethylbenzo[1,2b,5,4-b]dithionaphthene was used as test system. Fifteen-day-old tumours were excised, minced and single-cell suspensions were prepared. The viable single-cell suspension of murine fibrosarcoma (10^6 cells in 0.2mL saline) was transplanted by subcutaneous injection on the dorsal side of hind limbs of the mice. When the tumor was grown to a diameter of 6-8mm, the experiments were conducted. Animals were administered intraperitoneally with 0.0, 0.25, 0.5, 1.0 and 2.0mg/kg body weight of commercially available Vinblastine sulfate.
Dosage form	0.25, 0.5, 1.0, 2.0mg/kg; ip; single injection
Applications	Vinblastine sulfate treatment reduces the incidence of DNA strand breaks in fibrosarcomas, blood leukocytes, and bone marrow cells in mice in a dose-dependent manner.

References:

- [1]. Calviño E, Tejedor MC, Sancho P, et al. JNK and NF κ B dependence of apoptosis induced by vinblastine in human acute promyelocytic leukaemia cells. Cell Biochemistry and Function. 2015 Jun; 33(4): 211-219.
- [2]. Rajagopalan R, Ranjan SK, Nair CK. Effect of vinblastine sulfate on γ -radiation-induced DNA single-strand breaks in murine tissues. Mutation Research/Genetic Toxicology and Environmental Mutagenesis. 2003 Apr 20;536(1-2):15-25.

Background

Vinblastine sulfate is a cytotoxic alkaloid [1]. Vinblastine sulfate inhibits the proliferation of cancer cells by inhibiting the polymerization of tubulin (nAChR: IC₅₀ = 8.9 μ M) and interfering with the formation of the spindle during cell division [2-3]. Vinblastine sulfate is used to treat several types of cancer (Hodgkin's lymphoma, non-small cell lung cancer, bladder cancer, brain cancer, melanoma,

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and testicular cancer) [4].

In human acute promyelocytic leukaemia (NB4) cells, Vinblastine sulfate (50µM; 19h) reduced NB4 cell viability in a time- and concentration-dependent manner and concurrently promoted apoptosis and cell cycle arrest [5]. In Caco-2 cells, completion of culture medium with Vinblastine sulfate (10nM; 19d) increased the P-gp mRNA and the expression at protein level [6]. In HeLa cells, Vinblastine sulfate (1, 10, 100, 1000, 10000µg/mL; 24h, 48h) treatment inhibits the proliferation of HeLa cells, and its inhibitory effect increases in a dose-dependent manner [7].

In fibrosarcoma mouse model, Vinblastine sulfate (0.25, 0.5, 1.0, 2.0mg/kg; ip; single injection) treatment reduces the incidence of DNA strand breaks in fibrosarcomas, blood leukocytes, and bone marrow cells in mice in a dose-dependent manner [8]. In Swiss mice, Vinblastine sulfate (0.5, 1.0, 1.5mg/kg; ip; single injection) is clastogenic in mouse bone marrow [9].

References:

- [1]. McKay DB, Burkman AM. Nicotinic and nonnicotinic receptor-mediated actions of vinblastine. Proceedings of the Society for Experimental Biology and Medicine. 1993 Jul; 203(3): 372-376.
- [2]. Pandya P, Agarwal LK, Gupta N, et al. Molecular recognition pattern of cytotoxic alkaloid vinblastine with multiple targets. Journal of Molecular Graphics and Modelling. 2014 Nov 1; 54: 1-9.
- [3]. Sui M, Fan W. Combination of γ-radiation antagonizes the cytotoxic effects of vincristine and vinblastine on both mitotic arrest and apoptosis. International Journal of Radiation Oncology* Biology* Physics. 2005 Mar 15; 61(4): 1151-1158.
- [4]. Du GH, Zhang YW, Kong XY, et al. Vinblastine and vincristine. Natural Small Molecule Drugs from Plants. 2018: 551-557.
- [5]. Calviño E, Tejedor MC, Sancho P, et al. JNK and NFκB dependence of apoptosis induced by vinblastine in human acute promyelocytic leukaemia cells. Cell Biochemistry and Function. 2015 Jun; 33(4): 211-219.
- [6]. Hellinger É, Bakk ML, Pócsa P, et al. Drug penetration model of vinblastine-treated Caco-2 cultures. European journal of pharmaceutical sciences. 2010 Sep 11; 41(1): 96-106.
- [7]. Yasin YS, Jumaa AH, Jabbar S, et al. Effect of laetrile vinblastine combination on the proliferation of the hela cancer cell line. Asian Pacific Journal of Cancer Prevention: APJCP. 2023; 24(12): 4329.
- [8]. Rajagopalan R, Ranjan SK, Nair CK. Effect of vinblastine sulfate on γ-radiation-induced DNA single-strand breaks in murine tissues. Mutation Research/Genetic Toxicology and Environmental Mutagenesis. 2003 Apr 20; 536(1-2): 15-25.

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[9]. Choudhury RC, Palo AK, Padhy A. Cytogenetic consequences of vinblastine treatment in mouse bone marrow. *Chemotherapy*. 2004 Oct 29; 50(4): 171-177.

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