Vincristine sulfate

Cat. No.: HY-N0488

CAS No.: 2068-78-2

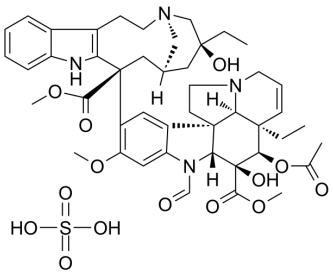
Molecular Formula: $C_{46}H_{58}N_4O_{14}S$

Molecular Weight: 923.04

Target: Microtubule/Tubulin; Apoptosis

Pathway: Cell Cycle/DNA Damage; Cytoskeleton; Apoptosis

Storage: 4°C, sealed storage, away from moisture and light
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 83.33 mg/mL (90.28 mM; ultrasonic and warming and heat to 80°C)
H_2O : 50 mg/mL (54.17 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.0834 mL	5.4169 mL	10.8338 mL
	5 mM	0.2167 mL	1.0834 mL	2.1668 mL
	10 mM	0.1083 mL	0.5417 mL	1.0834 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (108.34 mM); Clear solution; Need ultrasonic and warming and heat to 60°C
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (2.25 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (2.25 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (2.25 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Vincristine sulfate is an antitumor vinca alkaloid which inhibits microtubule formation in mitotic spindle, resulting in an arrest of dividing cells at the metaphase stage. It binds to microtubule with a K_i of 85 nM.

In Vitro

Vincristine inhibits net addition of tubulin dimers at assembly ends of steady-state microtubules with K_i of 85 nM[1]. Vincristine stabilizes the spindle apparatus resulting in failure of the chromosomes to segregate leading to metaphase

	arrest and inhibition of mitosis at low concentrations. At higher concentrations, Vincristine may disrupt and induce total depolymerization of microtubules[2]. Vincristine induces apoptosis in tumor cells and inhibits SH-SY5Y cell proliferation with IC_{50} of 0.1 μM. Vincristine induces mitotic arrest and promots the expression of caspase-3 and -9 and cyclin B, while decreasing the expression of cyclin D[3]. Vincristine induced neurotoxicity is caused by interference with microtubule function, which results in blockage of axonal transport and thus in axonal degeneration[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Vincristine (3 mg/kg, i.p.) induces mean growth delay of > 120 and > 52 day, and repopulates fractions of 0.06% and 5%, administrated in mice bearing bilateral subcutaneous xenografts Rh12 or Rh18, respectively[5]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [1]	Cells are plated in 2 mL of medium in 35 mm plates at a concentration of about 5×10^4 cells/mL and grow for 24 h at 37°C in an atmosphere of 5% CO_2 and 95% air. Then medium is replaced with fresh medium lacking or containing 4 nM drug and proliferation is continued for 3 days. Cell counts are done each day in a Coulter Counter after detaching the cells with trypsin and EDTA. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cell Mol Immunol. 2023 Jan;20(1):51-64.
- DRUG RESIST UPDATE. 2023 Feb 13;68:100951.
- J Clin Invest. 2024 Mar 7:e172716.
- Sci Adv. 2023 Feb 10;9(6):eade9238.
- Mol Ther. 2021 Jul 1;S1525-0016(21)00353-1.

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REFERENCES

[1]. Jordan, M.A., et al. Comparison of the effects of vinblastine, vincristine, vindesine, and vinepidine on microtubule dynamics and cell proliferation in vitro. Cancer Res, 1985. 45(6): p. 2741-7.

[2]. Gidding, C.E., et al, Vincristine revisited. Crit Rev Oncol Hematol, 1999. 29(3): p. 267-87.

[3]. Donoso, J.A., et al, Action of the vinca alkaloids vincristine, vinblastine, and desacetyl vinblastine amide on axonal fibrillar organelles in vitro. Cancer Res, 1977. 37(5): p. 1401-7.

[4]. Horton, J.K., et al. Relationships between tumor responsiveness, vincristine pharmacokinetics and arrest of mitosis in human tumor xenografts. Biochem Pharmacol, 1988. 37(20): p. 3995-4000.

[5]. Baguley, B.C., et al, Inhibition of growth of colon 38 adenocarcinoma by vinblastine and colchicine: evidence for a vascular mechanism. Eur J Cancer, 1991. 27(4): p. 482-7.

[6]. Zhang D, et al. Co-delivery nanoparticles with characteristics of intracellular precision release drugs for overcoming multidrug resistance. Int J Nanomedicine. 2017 Mar 16;12:2081-2108.

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

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