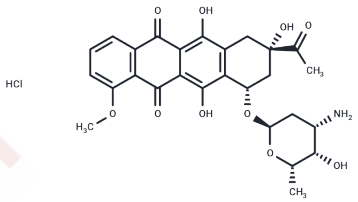
Data Sheet (Cat.No.T1511)

TargetMol

Daunorubicin hydrochloride

Chemical Properties



CAS No. : 23541-50-6

Formula: C27H29NO10·HCl

Molecular Weight: 563.99

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	Daunorubicin hydrochloride (Rubidomycin hydrochloride), an anthracycline aminoglycoside antineoplastic, inhibits DNA replication and repair and RNA and protein synthesis.
Targets(IC50)	Apoptosis,Antibacterial,Antibiotic,Autophagy,ADC Cytotoxin,DNA/RNA Synthesis, Topoisomerase
In vitro	At drug concentrations that reflect the peak plasma concentration after Daunorubicin administration, the primary mechanism is likely to be through interaction with topoisomerase II, which may be a primary triggering event for growth arrest and/or cell killing through a signalling pathway leading to apoptosis, at least in leukemic cells and thymocytes. The quinone structure permits daunorubicin to act as electron acceptors in reactions mediated by oxoreductive enzymes including cytochrome P450 reductase, NADH dehydrogenase, and xanthine oxidase. At Daunorubicin concentrations exceeding approximately 2-4 μM, free radical mediated toxicity and DNA cross-linking may become evident. Daunorubicin inhibits both DNA and RNA syntheses in HeLa cells over a concentration range of 0.2 through 2 μM. Daunorubicin inhibits both DNA syntheses in Ehrlich ascites tumor cells over a concentration range of 4 μM. Daunorubic triggers apoptosis at concentrations of 0.5 and 1 μM in either HL-60 or U-937 human leukemic cells. [1] Daunorubicin stimulates ceramide elevation and apoptosis in P388 and U937 cells through de novo synthesis via activation of the enzyme ceramide synthase. [2] Daunorubicin dose-dependently increases the phosphatidylserine exposure and consequent procoagulant activity of human umbilical vein endothelial cells. Daunorubicin (0.2 mM) significantly enhances the release of endothelial microparticles which are highly procoagulant in human umbilical vein endothelial cells.
In vivo	Urinary protein excretion, serum creatinine, and blood urea nitrogen (BUN) level are significantly increased in group Daunorubicin (3 mg/kg, i.v.) compared with those in group Control. Administration of Daunorubicin (DNR) causes a significant increase in malondialdehyde (MDA) level in renal tissue compared with that in the control group[5].
Cell Research	Daunorubicin (Dnr) is prepared in PBS[2]. The chemosensitivity to Daunorubicin is assessed using the MTT assay. In brief, the 96 well plates are set up with cells at the initial density of 2×105 cells/mL and are incubated at 37°C for 72 h in an atmosphere of 5% CO2 in the absence and presence of nine different concentrations of Daunorubicin (Dnr) or Dox ranging from 1.90 to 0.007 μM in triplicate. After incubation, 10 μL of MTT solution (5 mg/mL tetrazolium salt) is added to each well and the plates are incubated for a further 4 h at 37°C. The formazan salt crystals are dissolved by adding 100 μL 10%

Cell Research	SDS in 10 mM HCl solution and incubating over night at 37°C. The absorbance is measured at 540 nm with a reference at 650 nm by a 96-well enzyme-linked immunosorbent assay (ELISA) plate reader. Chemosensitivity is expressed as the IC50, which is the concentration of drug causing 50% cell survival compare to control cells grown without drug. Calculations are carried out using Microsoft Excel[2].

Solubility Information

Solubility	H2O: 92 mg/mL (163.12 mM),Sonication is recommended. DMSO: 252.5 mg/mL (447.7 mM),Sonication is recommended. Ethanol: < 1 mg/mL (insoluble or slightly soluble), (< 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 (8.87 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	1.7731 mL	8.8654 mL	17.7308 mL
5 mM	0.3546 mL	1.7731 mL	3.5462 mL
10 mM	0.1773 mL	0.8865 mL	1.7731 mL
50 mM	0.0355 mL	0.1773 mL	0.3546 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

Al-Aamri HM, et al. Time dependent response of daunorubicin on cytotoxicity, cell cycle and DNA repair in acute lymphoblastic leukaemia. BMC Cancer. 2019 Feb 27;19(1):179.

Wang B, He B S, Ruan X L, et al. An integrated microfluidics platform with high-throughput single-cell cloning array and concentration gradient generator for efficient cancer drug effect screening. Military Medical Research. 2022, 9(1): 1-17.

Idris N, Leong K H, Wong E H, et al.Unveiling synergism of polymyxin B with chloramphenicol derivatives against multidrug-resistant (MDR) Klebsiella pneumoniae.The Journal of Antibiotics.2023: 1-9.

Hueber A, et al. Characterization of daunorubicin-induced apoptosis in retinal pigment epithelial cells: modulation by CD95L. Invest Ophthalmol Vis Sci. 2003 Jul;44(7):2851-7.

Kim BR, et al. Daunorubicin induces GLI1-dependent apoptosis in colorectal cancer cell lines. Int J Oncol. 2024 Jun; 64(6):66.

Tardi P, et al. Leuk Res, 2009, 33(1), 129-139.

Arozal W, et al. Telmisartan prevents the progression of renal injury in daunorubicin rats with the alteration of angiotensin II and endothelin-1 receptor expression associated with its PPAR-γ agonist actions. Toxicology. 2011 Jan 11;279(1-3):91-9.

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