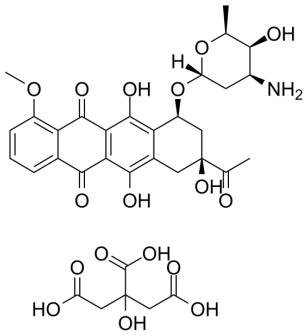
Daunorubicin citrate

Cat. No.:	HY-108876
CAS No.:	1884557-85-0
Molecular Formula:	$C_{33}H_{37}NO_{17}$
Molecular Weight:	719.64
Target:	Topoisomerase; DNA/RNA Synthesis; ADC Cytotoxin; Autophagy; Bacterial; Antibiotic; Apoptosis
Pathway:	Cell Cycle/DNA Damage; Antibody-drug Conjugate/ADC Related; Autophagy; Anti-infection; Apoptosis
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Daunorubicin (Daunomycin) citrate is a topoisomerase II inhibitor with potent anti-tumor activity. Daunorubicin citrate inhibits DNA and RNA synthesis. Daunorubicin citrate is a cytotoxin that inhibits cancer cell viability and induces apoptosis and necrosis. Daunorubicin citrate is also an anthracycline antibiotic. Daunorubicin citrate can be used in the research of infection and variety of cancers, including leukemia, non-Hodgkin lymphomas, Ewing's sarcoma, Wilms' tumor[1][2][4][5].
IC_{50} & Target	Topoisomerase II / Daunorubicins/Doxorubicins

In Vitro

Daunorubicin citrate (0-256 μg/mL, 30 min) inhibits DNA and RNA synthesis in sensitive and resistant Ehrlich ascites tumor cells[2].
Daunorubicin citrate (7 nM-1.9 μM, 72 h) shows chemosensitivity in Molt-4 cells and L3.6 cells[3][4].
Daunorubicin citrate (0.4 μM, 48 h) induces apoptotic and necrosis in L3.6 cells[4].
Daunorubicin citrate (0.4 μM, 120 min) induces ROS generation in L3.6 cells[4].
Daunorubicin citrate (2 μM, 24 h) induces autophagy in K562 cells (myeloid cell line)[6].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[3][4]

Cell Line:	Molt-4 cells (a human T-lymphoblastic leukemia cell line), L3.6 cells (metastatic human pancreatic cell line)
Concentration:	7 nM-1.9 μM
Incubation Time:	72 h
Result:	Inhibited cell viability with IC_{50} values of 40 nM (Molt-4) and 400 nM (L3.6).

Apoptosis Analysis[4]

Cell Line:	L3.6 cells
Concentration:	0.4 μM
Incubation Time:	24 h, 48 h

Result:	Induced necrosis without apoptosis at 24 h, induced both an apoptotic and extensive necrotic response at 48 h.

Western Blot Analysis[6]

Cell Line:	K562 cells
Concentration:	2 μM
Incubation Time:	24 h
Result:	Enabled the switch of LC3-I into LC3-II, accompanied with a significant increased expression level of LC3.

In Vivo

Daunorubicin citrate (intravenous injection, 3 mg/kg, three times at 48 h intervals) produces cardiotoxicity and nephrotoxicity in rats[5].
Daunorubicin citrate (intraperitoneal injection, 10 mg/kg) induces sister chromatid exchanges in mice[7].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male Sprague-Dawley rats[5]
Dosage:	3 mg/kg
Administration:	Intravenous injection, three times at 48 h intervals.
Result:	Caused a significant increase in MDA (malondialdehyde) level in renal tissue, accompanied by a significant reduction in total GPx activity. Increased urinary protein excretion, serum creatinine, and BUN level.

CUSTOMER VALIDATION

- Clin Cancer Res. 2020 Apr 15;26(8):2011-2021.
- J Control Release. 2022 Apr 22;346:136-147.
- Cancers (Basel). 2021, 13(5), 1127.
- Front Oncol. 2021 Apr 22;11:665763.
- Front Oncol. 2021 Apr 6.

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REFERENCES

[1]. Lehmann M, et al. Activity of topoisomerase inhibitors daunorubicin, idarubicin, and aclarubicin in the Drosophila Somatic Mutation and Recombination Test. Environ Mol Mutagen. 2004;43(4):250-7.

[2]. Dano K, et al. Inhibition of DNA and RNA synthesis by daunorubicin in sensitive and resistant Ehrlich ascites tumor cells in vitro. Cancer Res. 1972 Jun;32(6):1307-14.

[3]. Svensson SP, et al. Melanin inhibits cytotoxic effects of Doxorubicin and Daunorubicin in MOLT 4 cells. Pigment Cell Res. 2003 Aug;16(4):351-4.

[4]. Gervasoni JE Jr, et al. An effective in vitro antitumor response against human pancreatic carcinoma with paclitaxel and Daunorubicin by induction of both necrosis and apoptosis. Anticancer Res. 2004 Sep-Oct;24(5A):2617-26. h

[5]. 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.

[6]. Emeline Bollaert, et al. MiR-15a-5p Confers Chemoresistance in Acute Myeloid Leukemia by Inhibiting Autophagy Induced by Daunorubicin. Int J Mol Sci. 2021 May 13;22(10):5153.

[7]. Cheng Wu, et al. Doxorubicin suppresses chondrocyte differentiation by stimulating ROS production. Eur J Pharm Sci. 2021 Dec 1;167:106013.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA