Product Data Sheet

Product Name: Epirubicin
Cat. No.: GC35997

Chemical Properties

Cas. No.	56420-45-2		
SMILES	O=C(C1=C2C(O)=C3[C@@H](O[C@@]4([H])C[C@H](N)[C@@H](O)[C@H](C)O4)C[C@@](C(CO)=O)(O)CC3=C1O)C5=CC=CC(OC)=C5C2=O		
Formula	$C_{27}H_{29}NO_{11}$	M.Wt	543.52
Solubility	Soluble in DMSO	Storage	Store at -20°C,protect from light
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ 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	Epirubicin		

Protocol

Cell experiment [1]:

Cell lines	human glioma cell line U-87

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Preparation Method	The human glioma cell line U-87 cells were cultured in a standard tissue culture incubator (37˚C; 5% CO_2; 95% air; 100% humidity). Cells were regularly passaged by treatment with trypsin (0.05%) and were grown in Eagle's minimum essential medium (EMEM) supplemented with 10% fetal bovine serum (FBS), penicillin and streptomycin, non-essential amino acids, 1mg/ml glucose and 1mM pyruvate. The U-87 and neuronal cells were plated on 96well flatbottomed microplates at a density of 1×10^4cells/well in 100µl complete growth medium. Prior to drug treatment, the growth medium was substituted with fresh medium containing 2% FBS. The U-87 and neuronal cells were exposed to Epirubicin at concentrations of 0.5-100µM. After 48h of incubation at 37˚C in a humidified atmosphere of 5% CO_2, the cytotoxic effect of Epirubicin was estimated using an MTT assay. DNA synthesis in proliferating cells was evaluated by measuring Bromodeoxyuridine (BRDU) incorporation using a commercial Cell Proliferation ELISA System. MMP-9 levels in the conditioned media of the U-87 cells were determined using a commercial human MMP-9 immunoassay kit. Tumor cell migration was assessed using the wound healing assay.
Reaction Conditions	0.5-100µM; 48h
Applications	Epirubicin dose-dependently suppressed U-87 glioma cell proliferation, reduced MMP-9 secretion, and inhibited cell migration.

Animal experiment [2]:

Animal models	Female BALB/c mice

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Preparation Method	Female BALB/c mice (8 weeks, weighting 18 to 22g) were housed in a specified chamber with controlled air conditions (temperature 20-25°C, humidity 50–65%) and free access to sterile food and water. A 4T1 cell suspension (100μL, 5×10^6cells/mL) was injected subcutaneously into the right side of the fourth mammary gland of each mouse. The tumor length (L) and width (W) were measured every other day, and the tumor volume was calculated by using the following formula: V (mm^3)=($L\times W^2$)/2. On day 8 of 4T1 cells injection, the size of tumors was approximately 100 mm^3. Mice were randomly divided into two groups and accepted treatments every other day for eight times: Control group (Cont, n=8): mice received intragastrically administered (i.g.) and a tail intravenous injection of saline. Epirubicin group (n=8): mice received i.g. saline and a tail intravenous injection of Epirubicin (2.5mg/kg). The mice weights were recorded every other day. Blood was collected and the mice were sacrificed after 16 days. The tumors, hearts, and other tissues were removed rapidly and weighed. Several tissues were fixed in formalin for HE staining, TdT-mediated dUTP nick end labeling, and immunohistochemistry, whereas others were rapidly frozen in liquid nitrogen and stored in −80°C for Western blotting analysis.
Dosage form	2.5mg/kg; every other day for 16 days; i.v.
Applications	Epirubicin reduced tumor volume and increased tumor cell apoptosis in 4T1 breast cancer-bearing BALB/c mice.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

References:
[1] Wang XF, Zhao ZF, Chen MH, Yuan QH, Li YL, Jiang CL. Epirubicin inhibits growth and alters the malignant phenotype of the U87 glioma cell line. *Mol Med Rep*. 2015;12(4):5917-5923.
[2] Wu J, Xue X, Zhang B, et al. Enhanced antitumor activity and attenuated cardiotoxicity of Epirubicin combined with Paeonol against breast cancer. *Tumour Biol*. 2016;37(9):12301-12313.

Background

Epirubicin is an orally active, specific inhibitor of DNA topoisomerase II with an IC_{50} of 12μM[1]. Epirubicin forms a complex with DNA, blocks the re-ligation of DNA double strands, causes DNA damage, and interferes with DNA, RNA, and protein synthesis, thereby exerting broad-spectrum antitumor activity[2]. Epirubicin is commonly used in

research on solid tumors such as breast, liver, and gastric cancers, as well as malignant lymphomas[3].

In vitro, Epirubicin (0.5-100μM; 48h) dose-dependently suppressed U-87 glioma cell proliferation, reduced MMP-9 secretion, lowered VEGF release, and inhibited cell migration[4]. Treatment of HCT116 and SW620 colorectal cancer cells with Epirubicin (125nM; 48h) significantly upregulated TRAIL and enhanced TRAIL-induced apoptosis[5].

In vivo, Epirubicin (2.5mg/kg; every other day for 16 days; i.v.) reduced tumor volume and increased tumor cell apoptosis in 4T1 breast cancer-bearing BALB/c mice[6]. Epirubicin (7mg/kg; every 4 days ×3; i.v.) reduced tumor massin R-27 human breast carcinoma-bearing nude mice without increasing toxic death[7].

References:
[1] Cersosimo RJ, Hong WK. Epirubicin: a review of the pharmacology, clinical activity, and adverse effects of an adriamycin analogue. *J Clin Oncol*. 1986;4(3):425-439.
[2] Luiz MT, Dutra JAP, Di Filippo LD, et al. Epirubicin: Biological Properties, Analytical Methods, and Drug Delivery Nanosystems. *Crit Rev Anal Chem*. 2023;53(5):1080-1093.
[3] Robert J. Clinical pharmacokinetics of epirubicin. *Clin Pharmacokinet*. 1994;26(6):428-438.
[4] Wang XF, Zhao ZF, Chen MH, Yuan QH, Li YL, Jiang CL. Epirubicin inhibits growth and alters the malignant phenotype of the U87 glioma cell line. *Mol Med Rep*. 2015;12(4):5917-5923.
[5] Caldiran F, Berkel C, Yilmaz E, et al. Combination treatment of bortezomib and epirubicin increases the expression of TNFRSF10 A/B, and induces TRAIL-mediated cell death in colorectal cancer cells. *Biochem Biophys Res Commun*. 2023;675:33-40.
[6] Wu J, Xue X, Zhang B, et al. Enhanced antitumor activity and attenuated cardiotoxicity of Epirubicin combined with Paeonol against breast cancer. *Tumour Biol*. 2016;37(9):12301-12313.
[7] Asanuma F, Yamada Y, Kawamura E, et al. Antitumor activity of paclitaxel and epirubicin in human breast carcinoma, R-27. *Folia Microbiol (Praha)*. 1998;43(5):473-474.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA