Idarubicin hydrochloride

Cat. No.: HY-17381

CAS No.: 57852-57-0

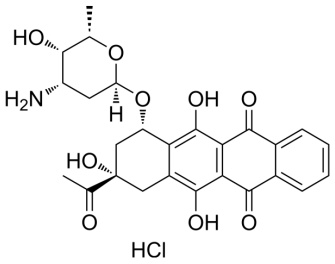
Molecular Formula: $C_{26}H_{28}ClNO_9$

Molecular Weight: 533.95

Target: Topoisomerase; Autophagy; Bacterial; Fungal; Antibiotic; DNA/RNA Synthesis; c-Myc

Pathway: Cell Cycle/DNA Damage; Autophagy; Anti-infection; Apoptosis

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



SOLVENT & SOLUBILITY

In Vitro

DMSO : 83.33 mg/mL (156.06 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.8728 mL	9.3642 mL	18.7283 mL
	5 mM	0.3746 mL	1.8728 mL	3.7457 mL
	10 mM	0.1873 mL	0.9364 mL	1.8728 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (3.90 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (3.90 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Idarubicin hydrochloride is an anthracycline antileukemic agent. It inhibits the topoisomerase II interfering with the replication of DNA and RNA transcription. Idarubicin hydrochloride inhibits the growth of bacteria and yeasts.

IC_{50} & Target

Topoisomerase II

In Vitro

The IC_{50} of Idarubicin hydrochloride is 3.3±0.4 ng/mL on MCF-7 monolayers and 7.9±1.1 ng/mL in multicellular spheroids[1]. Idarubicin hydrochloride has shown a greater cytotoxicity than daunorubicin or doxorubicin in various in vitro systems. This has been attributed to a better ability of idarubicin to induce the formation of topoisomerase II -mediated DNA breaks[2]. Idarubicin hydrochloride is about 57.5-fold and 25-fold more active than doxorubicin and epirubicin, respectively[3]. Idarubicin hydrochloride produces a concentration-dependent reduction in cell growth, with an IC_{50} value of approximately 0.01 μM. Idarubicin hydrochloride produced a concentration-dependent inhibition of DNA synthesis[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [1]

Stock solutions of idarubicin hydrochloride is dissolved in distilled water (1 mg/mL). MCF-7 monolayer are exposed to idarubicin or its metabolite idarubicinol at 0.01, 0.1, 1, 10, 100, and 1000 ng/mL for 24 hours. Multicellular spheroids are exposed to the same range of idarubicin and idarubicinol concentration as monolayers (0.01-1000 ng/mL) for 24 h and, in separate experiments, at the drug concentration of 100 ng/mL for 6, 12, 24 and 48 h. The inhibition of cell proliferation is determined by counting the viable cells with an hemocytometer. Results are expressed as percentage of cell survival vs. control cultures[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Commun. 2020 Apr 14;11(1):1792.
- Nucleic Acids Res. 2018 Apr 20;46(7):3284-3297.
- Cancer Lett. 2019 Oct 1;461:31-43.
- Anal Chem. 2022 Oct 4;94(39):13623-13630.
- J Virol. 2019 May 15;93(11):e02230-18.

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REFERENCES

[1]. Orlandi P, et al. Idarubicin and idarubicinol effects on breast cancer multicellular spheroids. J Chemother. 2005 Dec;17(6):663-7.

[2]. Robert J. Clinical pharmacokinetics of idarubicin. Clin Pharmacokinet. 1993 Apr;24(4):275-88.

[3]. Siegsmund MJ, et al. Enhanced in vitro cytotoxicity of idarubicin compared to epirubicin and doxorubicin in rat prostate carcinoma cells. Eur Urol. 1997;31(3):365-70.

[4]. Gewirtz DA, et al. Induction of DNA damage, inhibition of DNA synthesis and suppression of c-myc expression by the anthracycline analog, idarubicin (4-demethoxy-daunorubicin) in the MCF-7 breast tumor cell line. Cancer Chemother Pharmacol. 1998;41(5):361-

[5]. Kinnunen U, et al. Idarubicin inhibits the growth of bacteria and yeasts in an automated blood culture system. Eur J Clin Microbiol Infect Dis. 2009 Mar;28(3):301-3.

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