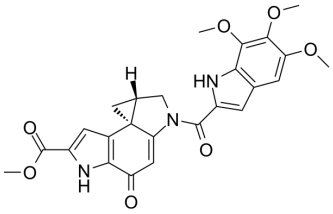
Duocarmycin SA

Cat. No.:	HY-12456
CAS No.:	130288-24-3
Molecular Formula:	$C_{25}H_{23}N_3O_7$
Molecular Weight:	477.47
Target:	ADC Cytotoxin; DNA Alkylator/Crosslinker; Antibiotic; Necroptosis; Apoptosis
Pathway:	Antibody-drug Conjugate/ADC Related; Cell Cycle/DNA Damage; Anti-infection; Apoptosis
Storage:	-20°C, stored under nitrogen * In solvent : -80°C, 6 months; -20°C, 1 month (stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 50 mg/mL (104.72 mM; Need ultrasonic)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	2.0944 mL	10.4719 mL	20.9437 mL
	5 mM	0.4189 mL	2.0944 mL	4.1887 mL
	10 mM	0.2094 mL	1.0472 mL	2.0944 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: ≥ 5 mg/mL (10.47 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 5 mg/mL (10.47 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Duocarmycin SA is an orally active antitumor antibiotic with an IC_{50} of 10 pM[1]. Duocarmycin SA is an extremely potent cytotoxic agent capable of inducing a sequence-selective alkylation of duplex DNA. Duocarmycin SA demonstrates synergistic cytotoxicity against glioblastoma multiforme (GBM) cells treated with proton radiation in vitro[2].

IC_{50} & Target

Duocarmycins

In Vitro

Duocarmycin SA (DSA) (0.1-1 nM; 72 hours) inhibits U-138 cell viability in a dose-dependent manner and activates apoptotic and necrotic pathways[2].

Duocarmycin SA (0.1 nM; 72 hours) sensitizes human glioma cells to proton irradiation[2].

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

Cell Viability Assay[1]

Cell Line:	U-138 cells
Concentration:	0.1, 0.5, 1 nM
Incubation Time:	72 hours
Result:	Produced a significant concentration-dependent decrease in cell viability, with 65% cell survival observed at 0.1 nM, and plateauing at a minimum of 25% cell survival at 0.5 nM, with no increase in cytotoxicity observed at higher doses. The IC_{50} of Duocarmycin SA for U-138 MG cells is 0.4 nM. Demonstrated strong cytotoxicity, with an IC_{50} of 0.0018 nM (1.8 pM).

Apoptosis Analysis[1]

Cell Line:	U-138 cells
Concentration:	0.001, 0.1 nM
Incubation Time:	3 or 14 days
Result:	Increased radio sensitivity of U-138 GBM cells by the activation of apoptotic and necrotic pathways. Greatly reduced survival fractions at different proton radiation doses (1-8 Gy).

In Vivo

Duocarmycin SA (0.143 mg/kg, i.p., single dose) shows antitumor activity in murine lymphocytic leukemia P388 transplanted in CDF_1 mice and shows a significant 30% increase in life span[3].

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

Animal Model:	Murine lymphocytic leukemia P388 transplanted in CDF_1 mice [3]
Dosage:	0.143 mg/kg
Administration:	Intraperitoneal injection (i.p.), single dose
Result:	Showed a significant 30% increase in life span.

REFERENCES

[1]. Boyle KE, et.al. Duocarmycin SA, a potent antitumor antibiotic, sensitizes glioblastoma cells to proton radiation. Bioorg Med Chem Lett. 2018 Sep 1;28(16):2688-2692.

[2]. Ichimura M,et.al. Duocarmycin SA, a new antitumor antibiotic from Streptomyces sp. J Antibiot (Tokyo). 1990 Aug;43(8):1037-8.

[3]. MacMillan KS, et al. Synthesis and evaluation of a thio analogue of duocarmycin SA. Bioorg Med Chem Lett. 2009 Dec 15;19(24):6962-5.

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