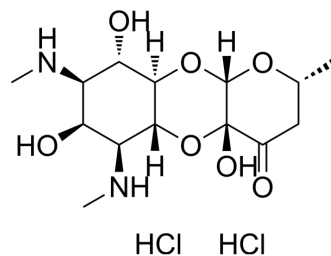


Spectinomycin dihydrochloride

Cat. No.:	HY-B0438
CAS No.:	21736-83-4
Molecular Formula:	C ₁₄ H ₂₆ Cl ₂ N ₂ O ₇
Molecular Weight:	405.27
Target:	Bacterial; Antibiotic
Pathway:	Anti-infection
Storage:	4°C, sealed storage, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro	H ₂ O : ≥ 100 mg/mL (246.75 mM) * "≥" means soluble, but saturation unknown.					
		Solvent Concentration	Mass			
	Preparing Stock Solutions	1 mM		1 mg	5 mg	10 mg
		5 mM		2.4675 mL	12.3375 mL	24.6749 mL
		10 mM		0.4935 mL	2.4675 mL	4.9350 mL
			0.2467 mL	1.2337 mL	2.4675 mL	
Please refer to the solubility information to select the appropriate solvent.						
In Vivo	1. Add each solvent one by one: PBS Solubility: 50 mg/mL (123.37 mM); Clear solution; Need ultrasonic					

BIOLOGICAL ACTIVITY

Description	Spectinomycin dihydrochloride is a broad-spectrum antibiotic and inhibits the growth of a variety of gram-positive and gram-negative organisms. Spectinomycin dihydrochloride acts by selectively targeting to the bacterial ribosome and interrupting protein synthesis. Spectinomycin dihydrochloride is also a noncompetitive inhibitor of td intron RNA with an K _i value of 7.2 mM ^{[1]-[5]} .
IC₅₀ & Target	bacterial ribosomal subunit ^[5]
In Vitro	<p>Spectinomycin dihydrochloride selectively inhibits protein synthesis in cells and in extracts of Escherichia coli: Spectinomycin dihydrochloride (50 µg/mL) inhibits Escherichia coli growth rapidly and reversibly, and suppresses amino acid incorporation immediately^[1].</p> <p>Spectinomycin dihydrochloride (1 µg/mL or 3 µM) inhibits polypeptide synthesis directed either by endogenous messenger RNA or by MS-2 bacteriophage RNA, with maximum inhibition of 70-80% in extracts of Escherichia coli^{[1][11]}.</p> <p>Spectinomycin dihydrochloride blocks the translocation of peptidyl-tRNAs from A-site to P-site by inhibiting the binding of</p>

elongation factor G to the ribosome^[2].

Spectinomycin dihydrochloride interacts specifically with the residues G1064 and O1192 in 16S rRNA and potentially makes it inactive^[2].

Spectinomycin dihydrochloride exhibits splicing inhibition and dependent on pH changes and Mg²⁺ concentration, indicating electrostatic interactions with the intron RNA^[3].

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

In Vivo

Spectinomycin dihydrochloride (20 mg/kg; i.m.; 20-100 mg/kg; 9 d) shows the safety in healthy chicks^[4].

Spectinomycin dihydrochloride (10 mg/kg; i.v.; single dose) has the major elimination pathway by renal excretion, approximately 55% is excreted into the urine in unchanged form^[5].

Pharmacokinetics of Spectinomycin dihydrochloride in Rat^[5]

Parameter	C ₀ (μg/mL)	AUC _{0-∞} (μg•h/mL)	V _d (L/kg)	CL (L/h/kg)	MRT (h)	T _{1/2α} (h)	T _{1/2β} (h)	T _{1/2γ} (h)	f _e	CL _{renal} (L/h/kg)	E _{ratio}
Non atrioventricular analysis	44.3	16.8	0.756	0.602	0.757	/	/	/	0.553	0.359	1.00
Three-compartment model	37.8	15.7	0.747	0.649	1.11	/	0.237	0.754	19.5	/	/

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

Animal Model: Arbor Acres plus broiler chicks (15-day-old)^[4]

Dosage: 20 mg/kg, 60 mg/kg, 100 mg/kg

Administration: Intramuscular injection (chest muscles); 9 days

Result: Showed biosecurity of 20 mg/kg by complete blood count, biochemical parameters, histopathological, clinical signs, body weight gain, and feed conversion ratio (FCR). Resulted minor toxicity of 60 mg/kg.

CUSTOMER VALIDATION

- BMC Vet Res. 2022 Jul 12;18(1):270.
- Patent. US20200368199A1.

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REFERENCES

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[2]. Brink MF, et al. Spectinomycin interacts specifically with the residues G1064 and C1192 in 16S rRNA, thereby potentially freezing this molecule into an inactive conformation. Nucleic Acids Res. 1994 Feb 11;22(3):325-31.

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- [4]. Khan EA, et al. Safety evaluation study of lincomycin and spectinomycin hydrochloride intramuscular injection in chickens. *Toxicol Rep*. 2022 Jan 29;9:204-209.
- [5]. Madhura DB, et al. Pharmacokinetic profile of spectinomycin in rats. *Pharmazie*. 2013 Aug;68(8):675-6.
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Caution: Product has not been fully validated for medical applications. For research use only.

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