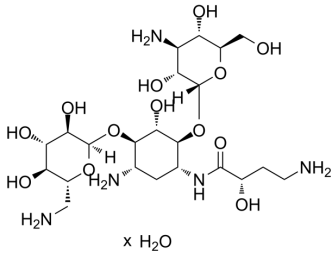
Amikacin hydrate

Cat. No.:	HY-B0509
CAS No.:	1257517-67-1
Molecular Formula:	$C_{22}H_{43}N_5O_{13}.xH_2O$
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_2O : 50 mg/mL (Need ultrasonic) DMSO : < 1 mg/mL (insoluble or slightly soluble)

BIOLOGICAL ACTIVITY

Description	Amikacin hydrate (BAY 41-6551 hydrate) is an aminoglycoside antibiotic and a semisynthetic analog of kanamycin. Amikacin hydrate is bactericidal, acting directly on the 30S and 50S bacerial ribosomal subunits to inhibit protein synthesis. Amikacin hydrate is very active against most Gram-negative bacteria including gentamicin- and tobramycin-resistant strains. Amikacin hydrate also inhibits the infections caused by susceptible Nocardia and nontuberculous mycobacteria[1][2].
IC_{50} & Target	Aminoglycoside
In Vitro	Amikacin offers definite advantages for treating infections caused by organisms resistant to other aminoglycosides. Amikaci is affected by relatively few arninoglycoside-modifying enzymes. Amikacin is useful in the treatment of infections caused by Nocardia asteroides, Mycobacterium avium-intracellulare, and certain species of "rapid-growing" mycobacteria (that is, M. chelonae and M. fortuitumi)[1]. Amikacin (100-1500 μM) causes a reliable dose-dependent loss of lateral line zebrafish hair cells with a LD_{50} value of 453 μM [3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Amikacin (320 mg/kg; subcutaneous injection; daily; for 10 days; male Fischer rats) treatment increases the chance of serious hearing loss in rats in vivo[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male Fischer 344 rats (40-50-day-old)[3]
Dosage:	320 mg/kg
Administration:	Subcutaneous injection; daily; for 10 days
Result:	Induced hearing loss in rats.

CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 2;13(1):1116.
- Int J Antimicrob Agents. 2018 Aug;52(2):269-271.
- J Antimicrob Chemother. 2020 Sep 1;75(9):2609-2615.
- J Antimicrob Chemother. 2020 Jul 1;75(7):1850-1858.
- Appl Microbiol Biotechnol. 2022 Apr;106(7):2689-2702.

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REFERENCES

[1]. Edson, R.S. and C.L. Terrell, The aminoglycosides. Mayo Clin Proc, 1999. 74(5): p. 519-28.

[2]. Ristuccia AM, et al. An overview of amikacin. Ther Drug Monit. 1985;7(1):12-25.

[3]. Siân R Kitcher, et al. ORC-13661 Protects Sensory Hair Cells From Aminoglycoside and Cisplatin Ototoxicity. JCI Insight. 2019 Aug 8;4(15):e126764.

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