Novobiocin sodium

Cat. No.: HY-B0425A

CAS No.: 1476-53-5

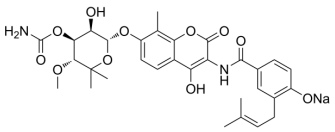
Molecular Formula: $C_{31}H_{35}N_2NaO_{11}$

Molecular Weight: 634.61

Target: Bacterial; Antibiotic; Orthopoxvirus; Apoptosis; DNA/RNA Synthesis; HSP

Pathway: Anti-infection; Apoptosis; Cell Cycle/DNA Damage; Metabolic Enzyme/Protease

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



SOLVENT & SOLUBILITY

In Vitro

H_2O : 50 mg/mL (78.79 mM; Need ultrasonic)
DMSO : ≥ 30 mg/mL (47.27 mM)
* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	1.5758 mL	7.8789 mL	15.7577 mL
5 mM	0.3152 mL	1.5758 mL	3.1515 mL
10 mM	0.1576 mL	0.7879 mL	1.5758 mL

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

In Vivo

1. Add each solvent one by one: PBS
Solubility: 100 mg/mL (157.58 mM); Clear solution; Need ultrasonic and warming and heat to 60°C

BIOLOGICAL ACTIVITY

Description

Novobiocin (Albamycin) sodium is a potent and orally active antibiotic. Novobiocin sodium also is a DNA gyrase inhibitor and a heat shock protein 90 (Hsp90) antagonist. Novobiocin sodium has the potential for the research of highly beta-lactam-resistant pneumococcal infections. Novobiocin sodium shows anti-orthopoxvirus activity[1][2][3][4].

IC_{50} & Target		
	β-lactam	HSP90

In Vitro

Novobiocin sodium (1 mM) competitively inhibits ATP binding to gyrase B to interfere with nucleotide binding and interferes with the association of the co-chaperones Hsc70 and p23 with Hsp90[1].
Novobiocin sodium (200 μM; 24 h) inhibits the rate of repair of both cis-DDP and BCNU induced DNA interstrand cross-links and with a corresponding decrease in the clonogenic survival of the human glioblastoma multiforme cells[2].
Novobiocin sodium (0.3 mM; 48 hours) induces a caspase-3/7 enzyme–dependent apoptosis assays with an induction of approximately three- to fivefold of apoptotic cells in K562, HL60, Mutz-2[5].

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

Western Blot Analysis[2]

Cell Line:	K562, HL60, Mutz-2 cells
Concentration:	0.3 mM
Incubation Time:	48 hours
Result:	Decreased caspase-3/7 activity in K562, HL60, Mutz-2 cells.

In Vivo

Novobiocin sodium (25, 50, 100, 200 mg/kg; s.c.; 4 times at 1, 5, 24 and 48 h after infection) shows anti-infection activity in mice infected with amoxicillin-resistant Streptococcus pneumoniae[3].

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

Animal Model:	30 g adult female Swiss mice (sepsis induced by the penicillin-susceptible strain (AR33118))[3]
Dosage:	25, 50, 100, 200 mg/kg
Administration:	S.c.; given at 1, 5, 24 and 48 h after infection
Result:	Showed anti-infection activity in mice infected with amoxicillin-resistant S. pneumoniae.

CUSTOMER VALIDATION

- Nat Methods. 2023 Jul 20.
- Blood. 2018 Jul 19;132(3):307-320.
- Adv Sci (Weinh). 2022 Oct 18;e2203088.
- Int J Mol Sci. 2019 Mar 5;20(5). pii: E1125.
- Mol Pharm. 2022 Oct 21.

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REFERENCES

[1]. Marcu MG, et al. The heat shock protein 90 antagonist novobiocin interacts with a previously unrecognized ATP-binding domain in the carboxyl terminus of the chaperone. J Biol Chem. 2000 Nov 24;275(47):37181-6.

[2]. Ali-Osman F, et al. Topoisomerase II inhibition and altered kinetics of formation and repair of nitrosourea and cisplatin-induced DNA interstrand cross-links and cytotoxicity in human glioblastoma cells. Cancer Res. 1993 Dec 1;53(23):5663-8.

[3]. Rodríguez-Cerrato V, et al. Comparative efficacy of novobiocin and amoxicillin in experimental sepsis caused by beta-lactam-susceptible and highly resistant pneumococci. Int J Antimicrob Agents. 2010 Jun;35(6):544-9.

[4]. Eder JP, et al. A phase I clinical trial of novobiocin, a modulator of alkylating agent cytotoxicity. Cancer Res. 1991 Jan 15;51(2):510-3.

[5]. Smee DF. Progress in the discovery of compounds inhibiting orthopoxviruses in animal models. Antivir Chem Chemother. 2008;19(3):115-24.

[6]. Bhatia S, et al. Targeting HSP90 dimerization via the C terminus is effective in imatinib-resistant CML and lacks the heat shock response.Blood. 2018 Jul 19;132(3):307-320.

Caution: Product has not been fully validated for medical applications. For research use only.

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