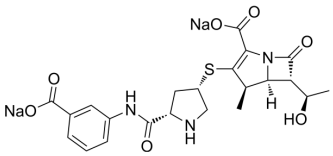
Ertapenem disodium

Cat. No.:	HY-A0294A
CAS No.:	153832-38-3
Molecular Formula:	$C_{22}H_{23}N_3Na_2O_7S$
Molecular Weight:	519.48
Target:	Bacterial; Antibiotic
Pathway:	Anti-infection
Storage:	-20°C, protect from light * In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



BIOLOGICAL ACTIVITY

Description	Ertapenem (MK-0826) disodium is a broad spectrum and long acting β-lactam antibiotic. Ertapenem disodium has a broad-spectrum anti-anaerobic activity against a variety of anaerobes with a mode MIC of 0.12 μg/mL. Ertapenem disodium can be used for the research of severe infections caused by bacteria in the skin, lungs, stomach, pelvis, and urinary tract[1][2].
IC_{50} & Target	β-lactam

In Vitro

Ertapenem disodium (0-100 μg/mL approximately, 48 h) is active against 99.1% of all anaerobes with a mode MIC of 0.12 μg/mL and MIC_{90} of 1 μg/mL, and MIC's ≥8 μg/mL for B.fragilis and B.vulgatus species, respectively[1].

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

Cell Viability Assay[1]

Cell Line:	B. fragilis (ATCC 25285), B. thetaiotaomicron (ATCC 29741), and Eubacterium lentum (ATCC 43055)
Concentration:	0-100 μg/mL approximately
Incubation Time:	48 h
Result:	Inhibited 99.1% of all isolate with a mode MIC of 0.12 μg/mL and MIC_{90} of 1 μg/mL, and 98.8% of the isolates were susceptible among the B. fragilis group.

In Vivo

Ertapenem disodium (Subcutaneous injection, 0-10 mg/kg, 0-120 h after infection, S. aureus thigh tissue infection model) shows > 3 log_{10} CFU reduction of organism at 10 mg/kg, and maintains the activity with 3.3 and 4.4 log_{10} CFU eliminated at 2 mg/kg[2].

Ertapenem disodium (Subcutaneous injection, 4h after infection, systemic infection model) is active against all gram-positive organisms, and is also active against gram-negative organisms tested with ED_{50}s of <0.25 mg/kg/dose[2].

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

Animal Model:	S. aureus thigh tissue infection model (DBA/2 mice)[2]
Dosage:	0.5,1, 2, 5, 10 mg/kg (given at 2, 6, 10, 24, 48, 72, 96, 120 h)
Administration:	Subcutaneous injection (0.5 mL after infection)

Result:	Displayed > 3 log_{10} CFU reduction of organism compared to non-antibiotic-treated controls at 10 mg/kg. Maintained the activity with 3.3 and 4.4 log_{10} CFU eliminated at 2 mg/kg.

Animal Model:	Systemic infection model (DBA/2 female mice, viral antibody-free CD-1 female mice)[2]
Dosage:	0-3 mg/kg approximately
Administration:	Subcutaneous injection (0.5 mL, begin immediately and 4 h after infection)
Result:	Showed activity against all gram-positive organisms, and also ram-negative organisms tested with ED_{50}s of <0.25 mg/kg/dose.

Animal Model:	CD-1 mice, rats[2]
Dosage:	10 mg/kg approximately
Administration:	Intraperitoneal injection (pharmacokinetic assay)
Result:	Exhibited an $AUC_{0-\infty}$ ranging from 1.8-21.82 μg•hr/mL in tissue in mice following a 10-mg/kg i.p. dose. Exhibited slow clearance rate with a $t_{1/2\beta}$ of 3.2 h, Clp of 0.47 mL/min/kg, AUC_{0-8} of 284.15 μg•hr/mL.

CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 2;13(1):1116.
- Nat Commun. 2021 Jul 22;12(1):4461.
- Proc Natl Acad Sci U S A. 2024 Jan 16;121(3):e2314514121.
- J Clin Microbiol. 2024 May 7:e0152023.
- J Antimicrob Chemother. 2023 Jul 31;dkad229.

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REFERENCES

[1]. Kenneth E Aldridge. Ertapenem (MK-0826), a new carbapenem: comparative in vitro activity against clinically significant anaerobes. Diagn Microbiol Infect Dis. 2002 Oct;44(2):181-6.

[2]. C J Gill, et al. In vivo activity and pharmacokinetic evaluation of a novel long-acting carbapenem antibiotic, MK-826 (L-749,345). Antimicrob Agents Chemother. 1998 Aug;42(8):1996-2001.

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