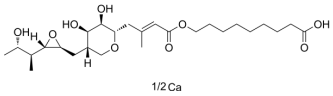
Mupirocin calcium

Cat. No.:	HY-B0958A
CAS No.:	104486-81-9
Molecular Formula:	$C_{26}H_{44}CaO_9$
Molecular Weight:	520.66
Target:	Antibiotic; Bacterial
Pathway:	Anti-infection
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Mupirocin (BRL-4910A, Pseudomonic acid) calcium is an orally active antibiotic isolated from Pseudomonas fluorescens. Mupirocin calcium apparently exerts its antimicrobial activity by reversibly inhibiting isoleucyl-transfer RNA, thereby inhibiting bacterial protein and RNA synthesis[1][2].

In Vitro

Mupirocin (BRL-4910A, Pseudomonic acid) calcium (0-100 μM; 48 h) shows antibacterial effect against staphylococci, streptococci and certain gram-negative bacteria, with MIC values range from 0.06-0.25 μg/mL (MIC_{50} =0.12 μg/mL, MIC_{90} =0.25 μg/mL)[1].

Mupirocin calcium is highly bound (95% bound) to human serum protein, thus results in activity inhibition in the presence of human serum[1].

Mupirocin calcium apparently exerts its antimicrobial activity by reversibly inhibiting isoleucyl-transfer RNA, thereby inhibiting bacterial protein and RNA synthesis[2].

Mupirocin calcium (2% ointment) reduces pro-inflammatory cytokines IL-1β and IL-17 level, decreases tumor necrosis factor-alpha (TNF-α) expression, and increases the leavel of vascular endothelial growth factor (VEGF)[4].

Mupirocin calcium inhibits MS (S. epidermidis ATCC 12228), MR (S. epidermidis (Se56-99)), and VIR (S. epidermidis (Se43-98)) with MICs of 0.25, 1.26, 1.59 mg/L[5].

Note: MIC, the minimum inhibition concentration.

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

Cell Viability Assay[1]

Cell Line:	Staphylococcus aureus
Concentration:	0-100 μM/mL
Incubation Time:	24, 48 hours
Result:	Resulted in a 90 to 99% reduction at 24 h, with MIC values ranged from 0.12-1.0 μM/mL and MBC values ranged from 4.0-32 μM/mL at 48 h.

In Vivo

MRSA: Meticillin-resistant Staphylococcus aureus

Mupirocin (BRL-4910A, Pseudomonic acid) calcium is well absorbed after oral and parenteral administration but serum antibiotic concentrations were short-lived as a result of extensive degradation to the antibacterially inactive metabolite, monic acid A[1].

Mupirocin calcium (2% ointment; external administration; twice daily; 3-6 d) decreases the total bacterial loads in the skin

lesions with either topical treatment[3].
Mupirocin calcium (2% ointment; external administration; 4 d) alleviates MRSA-infected pressure ulcers in mice[4].
Mupirocin calcium (100 mg/mL; s.c.; 7 d) exerts prevention efficacy against vascular prosthetic graft infection due to Staphylococcus epidermidis[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	MRSA skin infection model in mice (10-12 weeks old)[3]
Dosage:	2% ointment
Administration:	External administration; twice daily; 3-6 days
Result:	Reduced the total bacterial loads in the skin lesions, and decreased by 2.0, 5.1 log_{10} CFU on day 3 and 6, respectively.

Animal Model:	Diabetic pressure ulcer mouse model (33.2-39.2 g)[4]
Dosage:	2% ointment
Administration:	External administration; 4 days
Result:	Resulted less superficial mats of bacterial colonies, and improved histopathology evaluation.

Animal Model:	Adult male Wistar rats (weight 275-325 g)[5]
Dosage:	Impregnated with 100 μg of mupirocin/mL; segments:1.5 cm *1 cm^2
Administration:	Subcutaneous implantation; 7 days
Result:	Resulted in preventing S. epidermidis infection of the graft in a rat model with spontaneously bound to collagen-sealed Dacron grafts.

REFERENCES

[1]. Sutherland R, et al. Antibacterial activity of mupirocin (pseudomonic acid), a new antibiotic for topical use. Antimicrob Agents Chemother. 1985 Apr;27(4):495-8.

[2]. Parenti MA, et al. Mupirocin: a topical antibiotic with a unique structure and mechanism of action. Clin Pharm. 1987 Oct;6(10):761-70.

[3]. Vingsbo Lundberg C, et al. Efficacy of topical and systemic antibiotic treatment of meticillin-resistant Staphylococcus aureus in a murine superficial skin wound infection model. Int J Antimicrob Agents. 2013 Sep. 42(3):272-5.

[4]. Mohammad H, Abutaleb NS, Dieterly AM, Lyle LT, Seleem MN. Investigating auranofin for the treatment of infected diabetic pressure ulcers in mice and dermal toxicity in pigs. Sci Rep. 2021 May 25;11(1):10935.

[5]. Giacometti A, et al. Mupirocin prophylaxis against methicillin-susceptible, methicillin-resistant, or vancomycin-intermediate Staphylococcus epidermidis vascular-graft infection. Antimicrob Agents Chemother. 2000 Oct. 44(10):2842-4.

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

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