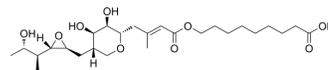


## Mupirocin

<b>Cat. No.:</b>	HY-B0958		
<b>CAS No.:</b>	12650-69-0		
<b>Molecular Formula:</b>	C <sub>26</sub> H <sub>44</sub> O <sub>9</sub>		
<b>Molecular Weight:</b>	500.62		
<b>Target:</b>	Bacterial; Antibiotic		
<b>Pathway:</b>	Anti-infection		
<b>Storage:</b>	Powder	-20°C	3 years
		4°C	2 years
	In solvent	-80°C	2 years
		-20°C	1 year



### SOLVENT & SOLUBILITY

#### In Vitro

DMSO : ≥ 100 mg/mL (199.75 mM)  
 \* "≥" means soluble, but saturation unknown.

Concentration	Mass		
	1 mg	5 mg	10 mg
<b>1 mM</b>	1.9975 mL	9.9876 mL	19.9752 mL
<b>5 mM</b>	0.3995 mL	1.9975 mL	3.9950 mL
<b>10 mM</b>	0.1998 mL	0.9988 mL	1.9975 mL

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

#### In Vivo

- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
 Solubility: ≥ 2.5 mg/mL (4.99 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
 Solubility: ≥ 2.5 mg/mL (4.99 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
 Solubility: ≥ 2.5 mg/mL (4.99 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

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

#### In Vitro

Mupirocin (BRL-4910A, Pseudomonic acid) (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<sub>50</sub> = 0.12 μg/mL, MIC<sub>90</sub> = 0.25 μg/mL)<sup>[1]</sup>.

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

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

Mupirocin (2% ointment) reduces pro-inflammatory cytokines IL-1 $\beta$  and IL-17 level, decreases tumor necrosis factor-alpha (TNF- $\alpha$ ) expression, and increases the level of vascular endothelial growth factor (VEGF)<sup>[4]</sup>.

Mupirocin 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<sup>[5]</sup>.

Note: MIC, the minimum inhibition concentration.

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

Cell Viability Assay<sup>[1]</sup>

Cell Line:	Staphylococcus aureus
Concentration:	0-100 $\mu$ M/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 $\mu$ M/mL and MBC values ranged from 4.0-32 $\mu$ M/mL at 48 h.

#### In Vivo

MRSA: Meticillin-resistant *Staphylococcus aureus*

Mupirocin (BRL-4910A, Pseudomonic acid) 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<sup>[1]</sup>.

Mupirocin (2% ointment; external administration; twice daily; 3-6 d) decreases the total bacterial loads in the skin lesions with either topical treatment<sup>[3]</sup>.

Mupirocin (2% ointment; external administration; 4 d) alleviates MRSA-infected pressure ulcers in mice<sup>[4]</sup>.

Mupirocin (100 mg/mL; s.c.; 7 d) exerts prevention efficacy against vascular prosthetic graft infection due to *Staphylococcus epidermidis*<sup>[5]</sup>.

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) <sup>[3]</sup>
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 <sub>10</sub> CFU on day 3 and 6, respectively.

Animal Model:	Diabetic pressure ulcer mouse model (33.2-39.2 g) <sup>[4]</sup>
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) <sup>[5]</sup>
Dosage:	Impregnated with 100 $\mu$ g of mupirocin/mL; segments:1.5 cm *1 cm <sup>2</sup>

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Administration:	Subcutaneous implantation; 7 days
Result:	Resulted in preventing <i>S. epidermidis</i> infection of the graft in a rat model with spontaneously bound to collagen-sealed Dacron grafts.

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## REFERENCES

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- [1]. Vingsbo Lundberg C, et al. Efficacy of topical and systemic antibiotic treatment of methicillin-resistant *Staphylococcus aureus* in a murine superficial skin wound infection model. *Int J Antimicrob Agents*. 2013 Sep. 42(3):272-5.
- [2]. 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.
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- [5]. Parenti MA, et al. Mupirocin: a topical antibiotic with a unique structure and mechanism of action. *Clin Pharm*. 1987 Oct;6(10):761-70.
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**Caution: Product has not been fully validated for medical applications. For research use only.**

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