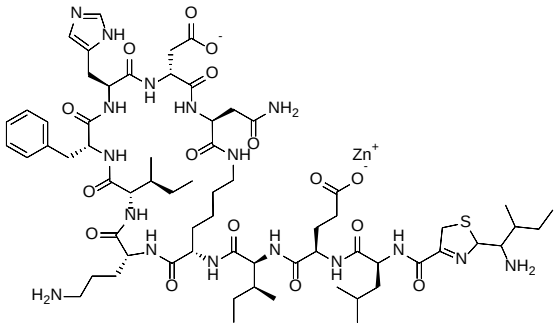
Product data sheet

MedKoo Cat#: 574449 Name: Bacitracin Zinc CAS#: 1405-89-6 Chemical Formula: $C_{66}H_{101}N_{17}O_{16}SZn$ Exact Mass: 1483.6624 Molecular Weight: 1486.08	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:
Bacitracin Zinc is a cyclic polypeptide antibiotic. Formulations containing bacitracin, often combined with other antibiotics, are used for topical treatment of infections in humans and animals. The activity of bacitracin can be enhanced by zinc. Bacitracin sequesters C55-isopropyl pyrophosphate (IPP), a lipid carrier in peptidoglycan synthesis, and in this way disrupts cell wall biosynthesis.

2. CoA, QC data, SDS, and handling instruction
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	50.50	33.98
1M HCl	50.0	33.65
Water	1.0	0.67

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	0.67 mL	3.36 mL	6.73 mL
5 mM	0.13 mL	0.67 mL	1.35 mL
10 mM	0.07 mL	0.34 mL	0.67 mL
50 mM	0.01 mL	0.07 mL	0.13 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator
Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Schnell L, Felix I, Müller B, Sadi M, von Bank F, Papatheodorou P, Popoff MR, Aktories K, Waltenberger E, Benz R, Weichbrodt C, Fauler M, Frick M, Barth H. Revisiting an old antibiotic: bacitracin neutralizes binary bacterial toxins and protects cells from intoxication. FASEB J. 2019 Apr;33(4):5755-5771. doi: 10.1096/fj.201802453R. Epub 2019 Jan 30. PMID: 30699302.
2. Zhu Z, Schnell L, Müller B, Müller M, Papatheodorou P, Barth H. The Antibiotic Bacitracin Protects Human Intestinal Epithelial Cells and Stem Cell-Derived Intestinal Organoids from Clostridium difficile Toxin TcdB. Stem Cells Int. 2019 Aug 5;2019:4149762. doi: 10.1155/2019/4149762. PMID: 31467562; PMCID: PMC6701344.

In vivo study

1. Sikand G, Havlicek V. Bacitracin produces analgesia by increasing brain immunoreactive beta-endorphin (beta-E) content. Brain Res. 1982 Jun 17;242(1):119-23. doi: 10.1016/0006-8993(82)90501-7. PMID: 7104723.

7. Bioactivity
Biological target: Bacitracin Zinc is a dephosphorylation of the C55-isoprenyl pyrophosphate interference for inhibition of cleavage of Tyr from Met-enkephalin with IC50 of 10 μM.

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In vitro activity

To investigate the effect of Bacitracin (Bac) on the intoxication of cells with the binary actin ADP-ribosylating C2 toxin, HeLa cells were incubated with recombinantly expressed C2 toxin in the absence and presence of Bac. After different incubation periods, the number of round cells was determined as a specific and highly sensitive endpoint for the C2 toxin–mediated destruction of the actin cytoskeleton of the cells. As shown in Fig. 1A, the number of round cells was significantly reduced in the presence of Bac, indicating that Bac protects cells from the intoxication with recombinant C2 toxin.

Reference: FASEB J. 2019 Apr;33(4):5755-5771. https://faseb.onlinelibrary.wiley.com/doi/10.1096/fj.201802453R

In vivo activity

The effects of protease inhibitor bacitracin on brain beta-endorphin content and analgesia, were examined in vivo. Male Sprague-Dawley rats were injected with bacitracin intracerebroventricularly and sacrificed by microwave irradiation 15 and 30 min after injection. Brain beta-endorphin levels were 27% higher in bacitracin treated rats than in controls. A second group of bacitracin injected rats was subjected to continuous intermittent 55 degrees C hot plate exposure. Bacitracin-injected rats exhibited total analgesia 15 min after bacitracin injection. At 30 min, this analgesic effect subsided. Control rats exhibited no analgesia. These results suggest that bacitracin induced analgesia might be due to the elevated levels of brain beta-endorphin caused by a decrease in its breakdown by bacitracin.

Reference: Brain Res. 1982 Jun 17;242(1):119-23.
https://www.sciencedirect.com/science/article/abs/pii/0006899382905017?via%3Dihub

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.