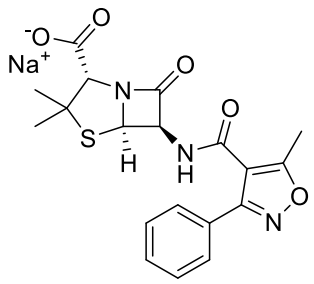
Product data sheet

MedKoo Cat#: 318393 Name: Oxacillin sodium CAS: 1173-88-2 (sodium) Chemical Formula: $C_{19}H_{18}N_3NaO_5S$ Exact Mass: 401.1045 Molecular Weight: 423.4188	
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:
Oxacillin is a narrow-spectrum beta-lactam antibiotic of the penicillin class. It is similar to methicillin, and has replaced methicillin in clinical use. Other related compounds are nafcillin, cloxacillin, dicloxacillin, and flucloxacillin. Since it is resistant to penicillinase enzymes, such as that produced by Staphylococcus aureus, it is widely used clinically in the US to treat penicillin-resistant Staphylococcus aureus.

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
DMF	20.0	47.23
DMSO	75.33	177.92
Ethanol	5.0	11.81
PBS (pH 7.2)	10.0	23.62
Water	85.0	200.75

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.36 mL	11.81 mL	23.62 mL
5 mM	0.47 mL	2.36 mL	4.72 mL
10 mM	0.24 mL	1.18 mL	2.36 mL
50 mM	0.05 mL	0.24 mL	0.47 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. Wang J, Ma X, Li J, Shi L, Liu L, Hou X, Jiang S, Li P, Lv J, Han L, Cheng Y, Han B. The Synergistic Antimicrobial Effect and Mechanism of Nisin and Oxacillin against Methicillin-Resistant Staphylococcus aureus. Int J Mol Sci. 2023 Apr 3;24(7):6697. doi: 10.3390/ijms24076697. PMID: 37047670; PMCID: PMC10094802.
2. Rudkin JK, Laabei M, Edwards AM, Joo HS, Otto M, Lennon KL, O'Gara JP, Waterfield NR, Massey RC. Oxacillin alters the toxin expression profile of community-associated methicillin-resistant Staphylococcus aureus. Antimicrob Agents Chemother. 2014;58(2):1100-7. doi: 10.1128/AAC.01618-13. Epub 2013 Dec 2. PMID: 24295979; PMCID: PMC3910814.

In vivo study

1. Kaul M, Ferrer-González E, Mark L, Parhi AK, LaVoie EJ, Pilch DS. Combination with a FtsZ inhibitor potentiates the in vivo efficacy of oxacillin against methicillin-resistant Staphylococcus aureus. Med Chem Res. 2022 Oct;31(10):1705-1715. doi: 10.1007/s00044-022-02960-5. Epub 2022 Sep 5. PMID: 37065467; PMCID: PMC10104549.

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2. Jiang W, Li B, Zheng X, Liu X, Cen Y, Li J, Pan X, Cao H, Zheng J, Zhou H. Artesunate in combination with oxacillin protect sepsis model mice challenged with lethal live methicillin-resistant Staphylococcus aureus (MRSA) via its inhibition on proinflammatory cytokines release and enhancement on antibacterial activity of oxacillin. Int Immunopharmacol. 2011 Aug;11(8):1065-73. doi: 10.1016/j.intimp.2011.02.028. Epub 2011 Mar 21. PMID: 21396483.

7. Bioactivity

Biological target:

Oxacillin is a narrow-spectrum beta-lactam antibiotic of the penicillin class.

In vitro activity

As oxacillin is known to increase mecA expression levels, it may be possible to attenuate the toxicity of CA-MRSA by using this antibiotic. Subinhibitory oxacillin concentrations induced PBP2a expression, repressed Agr activity, and, as a consequence, decreased phenol-soluble modulin (PSM) secretion by CA-MRSA strains. However, consistent with other studies, oxacillin also increased the expression levels of alpha-toxin and Panton-Valentine leucocidin (PVL).

Reference: Antimicrob Agents Chemother. 2014;58(2):1100-7. https://pubmed.ncbi.nlm.nih.gov/24295979/

In vivo activity

Co-administration with TXA709 renders oxacillin efficacious in mouse models of both systemic and tissue infection with MRSA, with this efficacy being observed at human-equivalent doses of oxacillin well below that recommended for daily adult use. Pharmacokinetic evaluations in mice reveal that co-administration with TXA709 also increases total exposure to oxacillin.

Reference: Med Chem Res. 2022 Oct;31(10):1705-1715. https://pubmed.ncbi.nlm.nih.gov/37065467/