# PRODUCT INFORMATION

## Cloxacillin-$^{13}C_4$ (sodium salt)

*Item No. 28801*

**Formal Name:** (2S,5R,6R)-6-(3-(2-chlorophenyl)-5-(methyl-$^{13}$C)isoxazole-4-carboxamido-$^{13}$C)-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylate, monosodium salt

**MF:** $C_{15}[^{13}C_4]H_{17}ClN_3O_5S \bullet Na$

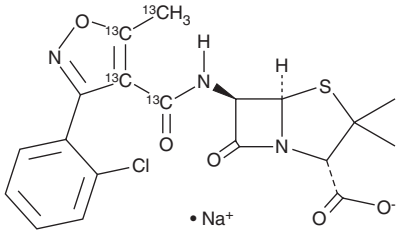
**FW:** 461.8

**Purity:** ≥95%

**Supplied as:** A solid

**Storage:** -20°C

**Stability:** ≥4 years



*Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.*

### Laboratory Procedures

Cloxacillin-$^{13}C_4$ (sodium salt) is supplied as a solid. A stock solution may be made by dissolving the cloxacillin-$^{13}C_4$ (sodium salt) in the solvent of choice, which should be purged with an inert gas. Cloxacillin-$^{13}C_4$ (sodium salt) is slightly soluble in methanol and DMSO.

Cloxacillin-$^{13}C_4$ (sodium salt) is slightly soluble in aqueous solutions. To enhance aqueous solubility, dilute the organic solvent solution into aqueous buffers or isotonic saline. If performing biological experiments, ensure the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. We do not recommend storing the aqueous solution for more than one day.

### Description

Cloxacillin-$^{13}C_4$ is intended for use as an internal standard for the quantification of cloxacillin (Item No. 22249) by GC- or LC-MS. Cloxacillin is a β-lactam antibiotic and a derivative of oxacillin (Item No. 23954).[1] It is active against clinical isolates of the Gram-positive bacteria *S. aureus* and *S. epidermidis* (MICs = 0.004-0.4 and 0.1-0.8 µg/ml, respectively) but not 34 Gram-negative bacteria (MICs = >128 µg/ml for all).[1,2] Cloxacillin binds to *S. aureus* penicillin-binding protein 1 (PBP1), PBP2, PBP3, and PBP4 ($IC_{50}$s = 0.04, 0.12, 0.21, and 2.5 µg/ml, respectively).[3] It also binds to recombinant type Ib penicillinase, as well as *P. vulgaris* and *C. freundii* cephalosporinase ($K_i$s = 15, 0.27, and 0.027 µM, respectively).[4] Cloxacillin decreases the number of staphylococci in the mammary gland in a mouse model of acute, but not chronic, mastitis induced by *Staphylococcus* infection.[5]

### References


1. Gibbs, D.L. and Thornsberry, C. Susceptibility of gram-negative bacteria to β-lactam antibiotics and rapid characterization of β-lactamase activity. *Curr. Microbiol.* **2,** 239-244 (1979).
2. Sabath, L.D., Garner, C., Wilcox, C., *et al.* Susceptibility of Staphylococcus aureus and Staphylococcus epidermidis to 65 antibiotics. *Antimicrob. Agents Chemother.* **9(6),** 962-969 (1976).
3. Okonogi, K., Noji, Y., Nakao, M., *et al.* The possible physiological roles of penicillin-binding proteins of methicillin-susceptible and methicillin-resistant Staphylococcus aureus. *J. Infect. Chemother.* **1,** 50-58 (1995).
4. Yamaguchi, A., Adachi, A., Hirata, T., *et al.* Conversion of cloxacillin into a progressive inhibitor of beta-lactamases by sulfonation and its activity against various types of these enzymes. *J. Antibiot. (Tokyo)* **38(1),** 83-93 (1985).
5. Craven, N. and Anderson, J.C. Therapy of experimental staphylococcal mastitis in the mouse with cloxacillin and rifampicin, alone and in combination. *Res. Vet. Sci.* **31(3),** 295-300 (1981).





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