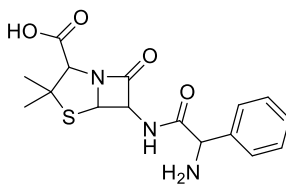


# Product data sheet



MedKoo Cat#: 317188 Name: Ampicillin CAS#: 69-53-4 Chemical Formula: C <sub>16</sub> H <sub>19</sub> N <sub>3</sub> O <sub>4</sub> S Exact Mass: 349.10963 Molecular Weight: 349.4	
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:

Ampicillin is an antibiotic used to prevent and treat a number of bacterial infections. This includes respiratory tract infections, urinary tract infections, meningitis, salmonella infections, and endocarditis. It may also be used to prevent group B streptococcal infection in newborns. It is used by mouth, by injection into a muscle, or intravenously. It is not useful for the treatment of viral infections. Ampicillin was developed in 1961. It is on the World Health Organization's List of Essential Medicines, the most important medication needed in a basic health system. Ampicillin is in the penicillin group of beta-lactam antibiotics and is part of the aminopenicillin family. It is roughly equivalent to amoxicillin in terms of activity. Ampicillin is able to penetrate Gram-positive and some Gram-negative bacteria. It differs from penicillin G, or benzylpenicillin, only by the presence of an amino group. That amino group helps the drug penetrate the outer membrane of Gram-negative bacteria. Ampicillin acts as an irreversible inhibitor of the enzyme transpeptidase, which is needed by bacteria to make their cell walls. It inhibits the third and final stage of bacterial cell wall synthesis in binary fission, which ultimately leads to cell lysis; therefore ampicillin is usually bacteriocidal.

## 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

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.86 mL	14.31 mL	28.62 mL
5 mM	0.57 mL	2.86 mL	5.72 mL
10 mM	0.29 mL	1.43 mL	2.86 mL
50 mM	0.06 mL	0.29 mL	0.57 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

Lepe JA, Rodríguez-Villodres A, Martín-Gutiérrez G, Luque R, Aznar J. In vitro study of synergy of ampicillin with ceftriaxone against *Listeria monocytogenes*. Rev Esp Quimioter. 2019 Oct;32(5):465-468. Epub 2019 Sep 12. PMID: 31515975; PMCID: PMC6790883.

In vivo study

Feltrin-Souza J, Jeremias F, Alaluusua S, Sahlberg C, Santos-Pinto L, Jernvall J, Sova S, Cordeiro RCL, Cerri PS. The effect of amoxicillin on dental enamel development in vivo. Braz Oral Res. 2020 Sep 4;34:e116. doi: 10.1590/1807-3107bor-2020.vol34.0116. PMID: 32901731.

# Product data sheet



## 7. Bioactivity

### Biological target:

Ampicillin binds to and inactivates penicillin-binding proteins (PBP) located on the inner membrane of the bacterial cell wall.

### In vitro activity

To evaluate if the in vitro activity of ampicillin increases when combined with ceftriaxone. The activity of ampicillin and ceftriaxone was evaluated against six *Listeria monocytogenes* invasive clinical isolates. Ampicillin and ceftriaxone MICs were determined by the broth microdilution method. Synergy was evaluated by checkerboard and time-kill curves methods. All six *L. monocytogenes* strains were susceptible to ampicillin (MICs 0.25-0.5 mg/L). A bacteriostatic synergy was demonstrated by the FIC index of 0.5 and a 2.5 log<sub>10</sub> CFU reduction on the six strains studied for MIC ampicillin plus 16 mg/L ceftriaxone concentrations. The association of ceftriaxone with ampicillin increases the in vitro activity of ampicillin, and therefore could be a valuable option in the treatment of invasive infection by *L. monocytogenes*.

Reference: Lepe JA, Rodríguez-Villodres A, Martín-Gutiérrez G, Luque R, Aznar J. In vitro study of synergy of ampicillin with ceftriaxone against *Listeria monocytogenes*. *Rev Esp Quimioter*. 2019 Oct;32(5):465-468. Epub 2019 Sep 12. PMID: 31515975; PMCID: PMC6790883.

### In vivo activity

This study aimed to determine if amoxicillin disturbs the enamel mineralization in in vivo experiments. Fifteen pregnant rats were randomly assigned into three groups to received daily phosphatase-buffered saline or amoxicillin as either 100 or 500 mg/kg. Mice received treatment from day 13 of pregnancy to day 40 postnatal. After birth, the offsprings from each litter continued to receive the same treatment according to their respective group. Calcium (Ca) and phosphorus (P) content in the dental hard tissues were analyzed from 60 upper first molars and 60 upper incisors by the complexometric titration method and colorimetric analysis using a spectrophotometer at 680 nm, respectively. Lower incisors were analyzed by X-ray microtomography, it was measured the electron density of lingual and buccal enamel, and the enamel and dentin thickness. Differences in Ca and P content and electron density among the groups were analyzed by one-way ANOVA. There was no significant difference on enamel electron density and thickness among the groups ( $p > 0.05$ ). However, in incisors, the higher dose of amoxicillin decreased markedly the electron density in some rats. There were no statistically significant differences in Ca ( $p = 0.180$ ) or P content ( $p = 0.054$ ), although the higher dose of amoxicillin could affect the enamel in some animals. The amoxicillin did not significantly alter the enamel mineralization and thickness in rats.

Reference: Feltrin-Souza J, Jeremias F, Alalususua S, Sahlberg C, Santos-Pinto L, Jernvall J, Sova S, Cordeiro RCL, Cerri PS. The effect of amoxicillin on dental enamel development in vivo. *Braz Oral Res*. 2020 Sep 4;34:e1116. doi: 10.1590/1807-3107bor-2020.vol34.0116. PMID: 32901731.

*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.*