Penicillin G sodium salt

Cat. No.: HY-B1463

CAS No.: 69-57-8

Molecular Formula: $C_{16}H_{17}N_2NaO_4S$

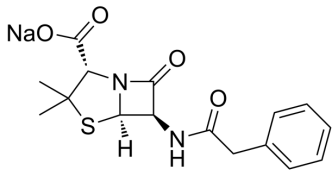
Molecular Weight: 356.37

Target: Bacterial; Antibiotic; Beta-lactamase

Pathway: Anti-infection

Storage: 4°C, sealed storage, away from moisture

* The compound is unstable in solutions, freshly prepared is recommended.



SOLVENT & SOLUBILITY

In Vitro

H_2O : 125 mg/mL (350.76 mM; Need ultrasonic)

DMSO : 100 mg/mL (280.61 mM; Need ultrasonic)

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	2.8061 mL	14.0304 mL	28.0607 mL
5 mM	0.5612 mL	2.8061 mL	5.6121 mL
10 mM	0.2806 mL	1.4030 mL	2.8061 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (280.61 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (7.02 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (7.02 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (7.02 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Penicillin G sodium salt is a typical β-lactam antibiotic.

IC_{50} & Target

β-lactam

In Vitro

The Ultraviolet-visible (UV-Vis) absorption spectrum of the Penicillin G sodium salt-TEM-1 system is markedly different to that of Penicillin G sodium salt and TEM-1 β-lactamase, indicating the formation of new complexes between Penicillin G

	sodium salt and TEM-1 β-lactamase. The UV-Vis absorption of TEM-1 β-lactamase increases and a slight red-shift occurs as the concentration of Penicillin G sodium salt increasing, indicating that the interaction between Penicillin G sodium salt and TEM-1 β-lactamase results in subtle conformational changes of TEM-1 β-lactamase[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	In the logistic regression model, the probability of a positive swab in the control group is 1.6 times higher than that in the pigs treated with Penicillin G sodium salt (P<0.05). In the control group, the risk of a swab having 10 to 99 colonies per plate, compare to having zero per plate, is 2.3 times greater than that in the pigs treated with Penicillin G sodium salt (P=0.022)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Kinase Assay [1]	At 278 K, various concentrations of Penicillin G sodium salt, cefalexin and cefoxitin solutions are added to TEM-1β-lactamase solution (5×10^{-6} M). The concentrations of the three antibiotics are gradually increased from 0 to 25×10^{-6} M. Following mixing and interaction for 2 min, the Ultraviolet-visible (UV-Vis) absorption spectra are recorded on a spectrophotometer with a slit of 2 nm and scanning speed of 400 nm/min using 0.02 M phosphate buffer (pH 7.0) as a reference[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	A randomized complete block design with 2 replicates is used for this study. Each replicate includes 448 pigs, with 16 pens and 28 pigs per pen. Pigs are also sorted by weight; such that animals of similar weight based on visual observation are grouped together within blocks. Two treatments are randomly assigned within each block of 2 contiguous pens using a formal randomization process. The treatment groups are Control (no treatment given) and Treated (Penicillin G sodium salt). Penicillin G sodium salt is administered via the drinking water for 5 d over 2 periods of treatment. The first treatment period commences on the day of weaning, when the pigs are moved into the nursery barns (Day 1) and ends on Day 5. The second treatment period begins on Day 21 and ends on Day 25. The Control group does not receive treatment[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Theranostics. 2022 Jan 1;12(3):1187-1203.
- Cancer Res. 2023 Feb 6;CAN-22-3169.
- EBioMedicine. 2022 Apr;78:103943.
- Chemosphere. 2019 Jun;225:378-387.
- Int Immunopharmacol. 2024 Jan 16:128:111524.

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REFERENCES

[1]. Yang J, et al. Spectroscopic analysis and docking simulation on the recognition and binding of TEM-1 β-lactamase with β-lactam antibiotics. Exp Ther Med. 2017 Oct;14(4):3288-3298.

[2]. Byra C, et al. Decreased mortality of weaned pigs with Streptococcus suis with the use of in-water potassium penicillin G. Can Vet J. 2011 Mar;52(3):272-6.

Caution: Product has not been fully validated for medical applications. For research use only.

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