

<b>Product Name:</b>	Ampicillin Trihydrate, EP
<b>Product Number:</b>	A020
<b>CAS Number:</b>	7177-48-2
<b>Molecular Formula:</b>	$C_{16}H_{19}N_3O_4S \cdot 3H_2O$
<b>Molecular Weight:</b>	403.44
<b>Appearance:</b>	White crystalline powder
<b>Solubility:</b>	slightly soluble in water (10 mg/mL) and freely soluble in 1 N HCl (50 mg/mL)
<b>Source:</b>	Semi-synthetic
<b>Water Content (Karl Fischer):</b>	12.0%-15.0%
<b>pH:</b>	3.5 -5.5
<b>Optical Rotation:</b>	+280° to +305°
<b>Storage Conditions:</b>	≤30°C
<b>Description:</b>	Ampicillin Trihydrate is a member of the β-lactam family and is similar in structure to penicillin.

TOKU-E offers five forms of Ampicillin:

- Ampicillin Trihydrate, EP (A020)
- Ampicillin Trihydrate, USP (A009)
- Ampicillin Sodium (A042)
- Ampicillin Anhydrous (A043)
- Ampicillin/Sulbactam (2:1) (A071)

Ampicillin Trihydrate is slightly soluble in water (10 mg/mL) and freely soluble in 1 N HCl (50 mg/mL).

<b>Mechanism of Action:</b>	Like all β-lactams, Ampicillin Trihydrate interferes with PBP (penicillin binding protein) activity otherwise involved in the final phase of peptidoglycan synthesis. PBP's are enzymes which catalyze a pentaglycine crosslink between alanine and lysine residues. Without a pentaglycine crosslink, the integrity of the cell wall is severely compromised ultimately leading to cell lysis.
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**Spectrum:** Ampicillin Trihydrate, EP targets non-ESBL (Extended Spectrum  $\beta$ -lactamase) bacteria including *Staphylococcus* and *Streptococcus* species and medically important enteric pathogens such as *Shigella* and *Salmonella*. Interestingly, ampicillin has been found to be effective against certain  $\beta$ -lactam sensitive VRE or vancomycin resistant *Enterococcus*; a glycopeptide antibiotic resistant "superbug." Resistance to ampicillin is routinely utilized as a selectable marker to confirm successful cell transformation.

**Microbiology Applications** Ampicillin Trihydrate is often used to select for cells that have been transformed with a plasmid containing the ampR gene which confers resistance to Ampicillin.

### Media Supplements

Ampicillin trihydrate can be used as a selective agent in several types of isolation media:

[Aeromonas Medium Base - Ampicillin Selective Supplement](#)

**References:** Pitout JD, Sanders CC, Sanders WE (1997) Antimicrobial resistance with focus on beta-lactam resistance in gram-negative bacilli. *Am. J. Med* 103(1):51-59 PMID 9236486

Waxman DJ and Strominger JL (1983) Penicillin-binding proteins and the mechanism of action of beta-lactam antibiotics. *Ann. Rev. Biochem* 52:825-869 PMID 6351730

Yang W, Zhang L, Lu Z, Tao W, Zhai Z (2001) A new method for protein coexpression in *Escherichia coli* using two incompatible plasmids. *Protein. Expr. Purif.* 22(3):472-478 PMID 11483011

If you need any help, contact us: [info@toku-e.com](mailto:info@toku-e.com). Find more information on: [www.toku-e.com/](http://www.toku-e.com/)