

Blasticidin S HCl Solution (10 mg/mL in 20mM HEPES) PRODUCT DATA SHEET

issue date 01/06/2020

Product Name:	Blasticidin S HCl Solution (10 mg/mL in 20mM HEPES)
Product Number:	B006-B007
CAS Number:	3513-03-9
Molecular Formula:	$C_{17}H_{26}N_8O_5 \cdot HCl$
Molecular Weight:	458.90 g/mol
Form:	Solution (sterile)
Appearance:	Clear and colorless or light yellow solution
Source:	<i>Streptomyces griseochromogenes</i>
pH:	7.2-7.5
Storage Conditions:	-20°C
Description:	<p>Blasticidin S HCl is a peptidyl nucleoside produced by several species of <i>Streptomyces</i> that was first isolated from <i>S. griseochromogenes</i> in 1958. Blasticidin S inhibits protein synthesis and is active against bacteria, fungi, nematodes, and tumor cells. The compound is used as a selection antibiotic for both eukaryotic and prokaryotic cells, and a marker for strain manipulation.</p> <p>TOKU-E carries two forms of Blasticidin S HCl:</p>

- Blasticidin S HCl solution (10 mg/ml in 20 mM HEPES)(B006-B007)
- Blasticidin S HCl (B001)

Blasticidin S HCl solution contains 10 mg/mL blasticidin S HCl in 20mM HEPES.

B006 (10 x 1 mL) contains 10 mg blasticidin S HCl per vial (100 mg total).

B007 (20 mL) contains 200 mg blasticidin S HCl per vial.

This product is considered a dangerous good. Quantities above 1 g may be subject to additional shipping fees.

Mechanism of Action: Blasticidin S HCl inhibits protein synthesis in prokaryotic and eukaryotic cells by binding to the ribosomal P-site which strengthens tRNA binding and slows down and prevents subsequent peptide synthesis.

Mechanisms of resistance

Resistance to Blasticidin S is conferred by *bsr*, *BSD*, and *bls* resistance genes isolated from *Bacillus cereus* K55-S1, *Aspergillus terreus*, and *Streptoverticillum* spp, respectively.

The ***bsr* resistance gene** is a 420 bp fragment and encodes a 15 kDa Blasticidin S deaminase which catalyzes the reaction of Blasticidin S to deaminohydroxyblasticidin S. Deaminohydroxyblasticidin S is a biologically inactive derivative of Blasticidin S and does not interact with or inhibit prokaryotic or eukaryotic ribosomes.

The ***bsd* resistance gene** is a 393 bp fragment and also encodes a Blasticidin S deaminase enzyme which catalyzes a similar reaction to the *BSR* deaminase. A study by Kimura et al. found the transfection frequency with *bsd* to be 80X greater than with *bsr* when using FM3A cells.

The ***bls* gene resistance gene** encodes an acetyltransferase which interacts with acetyl-coenzyme A and prevents Blasticidin S from inhibiting protein synthesis.

Microbiology Applications Blasticidin S HCl can be used as a selection agent after transformation of prokaryotic (bacterial) cells, namely *E. coli*. Optimal Blasticidin S HCl selection concentrations range from 25 - 100 µg/mL and should be tested for each experimental condition. Selective media containing Blasticidin S HCl should contain a low salt concentration (<90mM) and pH ≤7 to avoid blasticidin degradation.

References:

Adachi H, Hasebe T, Yoshinaga K , Ohta T and Sutoh K (1994) Isolation of *Dictyostelium discoideum* cytokinesis mutants by restriction enzyme-mediated integration of the Blasticidin S resistance marker. Biochem. Biophys. Res. Comm. 205(3):1808-1814

Bento, FM (2004) Over Expression of the Selectable Marker Blasticidin S Deaminase Gene Is Toxic to Human Keratinocytes and Murine BALB/MK Cells." BMC Biotechnol. 4 (29):1-10 PMID 15575952.

Izumi M. et al., 1991. Blasticidin S-resistance gene (*bsr*): A novel selectable marker for mammalian cells. Exp.Cell Res.197:229-33

Lu K-T et al (2016) Ovatodiolide inhibits breast cancer stem/progenitor cells through SMURF2-mediated downregulation of Hsp27. Toxins 8(5):127.

Kimura M, Takatsuki A, Yamaguchi I (1994) Blasticidin S deaminase gene from *Aspergillus terreus*(*BSD*): A new drug resistance gene for transfection of mammalian cells. Biochim. Biophys. Acta. 1219(3):653-65 PMID 7948022

Svidritskiy E, Ling C, Ermolenko DN, Korostelev AA (2013) Blasticidin S Inhibits Translation by Trapping Deformed TRNA on the Ribosome. PNAS 110(30):12283-12288 PMID 23824292

Takeuchi S, Hirayama K, Ueda K, Sakai H and Yonehara H (1958) Blasticidin S, a new antibiotic. J. Antibiot. 11(1):1-5 PMID 13525246

Yamaguchi I et al (1990) Expression of the Blasticidin S Deaminase Gene (*bsr*) in Tobacco: Fungicide Tolerance and a New Selective Marker for Transgenic Plants. Mol. Gen. Genet (2):332-334 PMID 2250657

If you need any help, contact us: info@toku-e.com. Find more information on: www.toku-e.com/