Polymyxin B1 Sulfate, EvoPure®
PRODUCT DATA SHEET

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Product Name:	Polymyxin B1 Sulfate, EvoPure®
Product Number:	P037
CAS Number:	4135-11-09
Molecular Formula:	$C_{56}H_{98}N_{16}O_{13} \cdot xH_2SO_4$ (lot specific)
Molecular Weight:	1203.47 g/mol (Free base)
Form:	Powder
Appearance:	White powder
Source:	*Pseudomonas sp.*
Storage Conditions:	-20°C
Description:	Polymyxin B1 sulfate is one of the polypeptide fractions in polymyxin B sulfate. The fatty acid group found in polymyxin B1 sulfate is 6-methyloctanoic acid (6-MOA); the same group found in polymyxin B1-I sulfate. Polymyxin B1 however, contains a L-leucine residue, rather than the L-isoleucine reside found in polymyxin B1-I sulfate. Results from *in vitro* studies have shown marginal differences in MIC data when comparing the fractions. **Kassamali, et al.** used polymyxin B1, polymyxin B2, polymyxin B3, and polymyxin B1-I to test for synergistic and antagonistic effects against various Gram-negative organisms. Read more here: "Microbiological Assessment of Polymyxin B Components Tested Alone and In Combination" **Lim et al.** used polymyxin B1, B2, B3, and B1-I from TOKU-E to study the stability of each compound in saline, dextrose, and saline/dextrose infusion solutions. "Physicochemical stability study of polymyxin B in various infusion solutions for administration to critically Ill patients."
Mechanism of Action:	Polymyxin B targets and alters permeability lipopolysaccharide (LPS) of gram negative bacteria leading to lysing of the cell. Polymyxin B only needs to interact with LPS, it is not required to enter the cell.
Spectrum:	Polymyxin B sulfate targets the outer membrane of gram negative bacteria especially *Pseudomonas aeruginosa.*

Microbiology Applications

Polymyxin B sulfate is commonly used in clinical *in vitro* microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against gram negative microbial isolates. Medical microbiologists use AST results to recommend antibiotic treatment options for infected patients. Representative MIC values include:

- *Pseudomonas aeruginosa* 0.25 µg/mL – 1 µg/mL
- For a complete list of polymyxin B sulfate MIC values, click here.

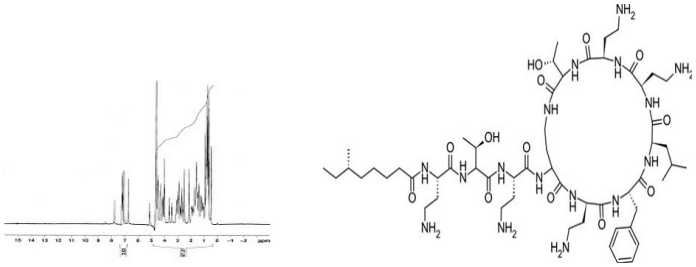
Plant Biology Applications

Polymyxin was successfully tested to counteract phytopathogenic gram-negative bacteria growth. Polymixin reduced bacterial growth of different strains of *Pseudomonas viridiflava* at low dosages (0.08 µg/ml) whereas *Erwinia carotovora* growth was inhibited at slightly higher concentrations (0.25 µg/ml) (Selim et al. 2005)

Technical Data:

Spectral Data - Polymyxin B1 sulfate, EvoPure®

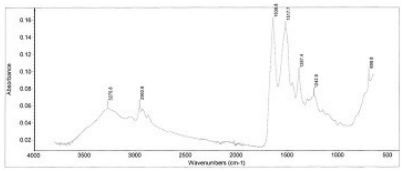
HNMR Spectra



Click to enlarge

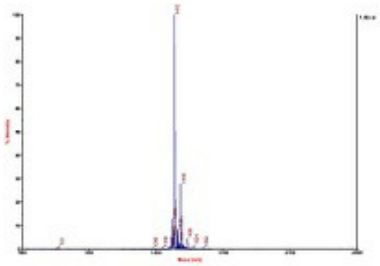
Solvent: D2O
Instrument: Mercury 300
Frequency: 300 MHz

FTIR Spectra



Click to enlarge

Mass Spectra



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References:

Newton, B. A. "The Properties and Mode of Action of the Polymyxins." *Bacteriology Reviews* (n.d.): 14-27. *www.ncbi.gov*. Web. 21 Aug. 2012.

Selim S., Negrel J., Govaerts C., Gianinazzi S. and Tuinen van D., 2005, Isolation and Partial Characterization of Antagonistic Peptides Produced by Paenibacillus sp. Strain B2 Isolated from the Sorghum Mycorrhizosphere. *Applied and Environmental Microbiology*, Nov. 2005, p. 6501–6507

Zavascki, Alexandre Prehn et al. "Polymyxin B for the Treatment of Multidrug-resistant Pathogens: A Critical Review." *Journal of Antimicrobial Chemotherapy* 60 (2007): 1206-215.*Oxfordjournals*. Web. 15 Jan. 2013.

Li, Jian et al. "Development and Validation of a Reversed-phase High-performance Liquid Chromatography Assay for Polymyxin B in Human Plasma." *Journal of Antimicrobial Chemotherapy* (2009): n. pag. *Oxfordjournals*. Web. 15 Jan. 2013.

Tam, Vincent H, et al. "In Vitro Potency of Various Polymyxin B Components." *In Vitro Potency of Various Polymyxin B Components* 55.9 (2011): 4490-491. *Asm.org*. Web. 15 Jan. 2013.

Orwa, J. A., et al "Isolation and Structural Characterization of Polymyxin B Components." *Isolation and Structural Characterization of Polymyxin B Components* 912.2 (2001): 369-73. *Sciencedirect*. Web. 15 Jan. 2013.

MJ Mueller, W Brodschelm. "Signaling in the elicitation process is mediated through the octadecanoid pathway leading to jasmonic acid". Proc. Natl. Acad. Sci. USA Vol. 90, pp. 7490-7494, August 1993.