3050 Spruce Street, St. Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

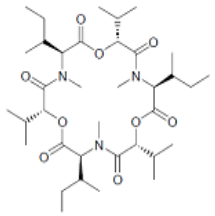
Product Information

Enniatin A from *Gnomonia errabuda*

Catalog Number **E9661**
Storage Temperature –20 °C

CAS RN 2503-13-1

Product Description
Molecular formula: $C_{36}H_{63}N_3O_9$
Molecular weight: 681.90



Enniatins are a group of cyclohexadepsipeptide mycotoxins produced by *Gnomonia errabuda* and several *Fusaria* species, with phytotoxic, antibiotic, and insecticidal activities.[1-4] Enniatins function as ionophores by their incorporation into the cellular membrane to form dimeric structures. They transport monovalent ions across the membrane, especially the mitochondrial membranes, affecting oxidative phosphorylation uncoupling.[5-8] It has been demonstrated enniatins have a cytotoxic effect on human cancer cells.[9] Furthermore, incubation of H4IIE hepatoma cells with enniatins strongly diminished phosphorylation of ERK (p44/p42).[10] Enniatins B and B1 were found to inhibit the multi-drug resistance transporter Pdr5p from *Saccharomyces cerevisiae*,[11] indicating their beneficial potential in cases of drug resistant patients.

Purity: ≥95% (HPLC)

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions
Soluble at 10 mg/mL in DMSO, methanol, and ethanol.

Storage/Stability
Store the product sealed at –20 °C. Under these conditions the product is stable for at least 2 years.

References
1. Gäumann, E. et al., Ionophore antibiotics produced by the fungus *Fusarium orthoceras var.* enniatum and other *Fusaria*. Experientia, **3**, 202 (1947).
2. Grove, J.F., and Pople, M., The insecticidal activity of beauvericin and the enniatin complex. Mycopathologia, **70**, 103-105 (1980).
3. Gupta, S. et al., Isolation of beauvericin as an insect toxin from *Fusarium semitectum* and *Fusarium moniliforme var*. subglutinans. Mycopathologia, **115**, 185-189(1991).
4. Ganassi, S. et al., Effects of beauvericin on *Schizaphis graminum* (Aphididae). J. Invertebr. Pathol., **80**, 90-96 (2002).
5. Ovchinnikov, Y.A. et al., The enniatin ionophores. Conformation and ion binding properties. Int. J. Pept. Protein Res., **6**, 465-498 (1974).
6. Lifson, S. et al., Enniatin B and valinomycin as ion carriers: An empirical force field analysis. J.Biomol. Struct. Dyn., **2**, 641-661 (1984).
7. Doebler, J.A., Effects of neutral ionophores on membrane electrical characteristics of NG108-15 cells. Toxicol. Lett., **114**, 27-38 (2000).
8. Ivanov V.T. et al., The far-infrared spectra of alkali metal ion complexes with valinomycin, beauvericin, nonactin and perhydroantamanide in solution. FEBS Lett., **30**, 199-204 (1973).
9. Dornetshuber, R. et al., Enniatin exerts p53-dependent cytostatic and p53-independent cytotoxic activities against human cancer cells. Chem. Res. Toxicol., **20**, 465-473 (2007).
10. Wätjen, W. et al., Enniatins A1, B and B1 from an endophytic strain of *Fusarium tricinctum* induce apoptotic cell death in H4IIE hepatoma cells accompanied by inhibition of ERK phosphorylation. Mol. Nutr. Food Res., **53**, 431-440 (2009).
11. Hiraga, K. et al., Enniatin has a new function as an inhibitor of Pdr5p, one of the ABC transporters in *Saccharomyces cerevisiae*. Biochem. Biophys. Res. Commun., **328**, 1119-1404 (2005).

DWF,MAM 06/11-1