

## Product Information

### **Pseudomonas exotoxin A** from *Pseudomonas aeruginosa*

Product Number **P 0184**

Storage Temperature 2-8 °C

#### **Product Description**

Molecular Weight: 66 kDa<sup>1</sup>

Isoelectric Point: 5.1<sup>1</sup>

$\lambda_{\text{max}}$ : 280 nm<sup>2</sup>

Extinction Coefficient:  $E^{1\%}_{1\text{cm}} = 11.9$  at 280 nm  
(0.5 M Tris-HCl, pH 8.1)<sup>2</sup>

*Pseudomonas aeruginosa* is a Gram-negative, rod-shaped, aerobic bacterium found widely in the environment including soil, water, sewage, and hospitals. This opportunistic pathogen secretes a number of extracellular proteins. Some strains of *P. aeruginosa* secrete an enzymatic protein called exotoxin A. The production of exotoxin A is dependent on exogenous iron levels. exotoxin A enters the cytoplasm of host cells by receptor-mediated endocytosis and catalyzes the ADP ribosylation of eukaryotic elongation factor 2 (eEF-2). Inactivation of eEF-2 inhibits protein synthesis, followed by eventual cell death.<sup>3,4</sup>

Structural studies suggest that exotoxin A consists of a receptor-binding domain, a translocation domain, and a catalytic domain. The catalytic domain (residues 400–613) is responsible for catalyzing the transfer of the ADP-ribosyl moiety from NAD to eEF-2. Structural and mutagenesis studies suggest that Glu<sup>553</sup>, His<sup>440</sup>, Tyr<sup>481</sup>, and Tyr<sup>470</sup> are important catalytic residues.<sup>3,4</sup>

Exotoxin A appears to be involved in local *P. aeruginosa* infections and systemic disease. Studies that compare the virulence of exotoxin A producing strains of *P. aeruginosa* to mutant strains that do not produce exotoxin A suggest that exotoxin A is an important virulence factor.<sup>5,6</sup>

#### **Precautions and Disclaimer**

For Laboratory Use Only. Not for drug, household or other uses.

#### **Preparation Instructions**

This product is soluble in water or neutral aqueous buffers (0.5mg/ml, 10 mM Tris-HCl, pH 8.0) resulting in clear to slightly hazy, colorless solution.

#### **Storage/Stability**

Buffered aqueous solutions can be stored frozen in single-use aliquots. Multiple freeze/thaw cycles should be avoided.

#### **References**

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2. O'Brien, A.D., et al., Biological properties of *Shigella flexneri* 2A toxin and its serological relationship to *Shigella dysenteriae* 1 toxin. *Infect. Immun.*, **15(3)**, 796-798 (1977).
3. Li, M., et al., Crystal structure of the catalytic domain of *Pseudomonas* exotoxin A complexed with a nicotinamide adenine dinucleotide analog: implications for the activation process and for ADP ribosylation. *Proc. Natl. Acad. Sci. USA*, **93(14)**, 6902–6906 (1996).
4. Armstrong, S., et al., Insight into the catalytic mechanism of *Pseudomonas aeruginosa* exotoxin A. Studies of toxin interaction with eukaryotic elongation factor-2. *J. Biol. Chem.*, **277(4)**, 46669-46675 (2002).
5. Pittet, J.F., et al., Exotoxin A stimulates fluid reabsorption from distal airspaces of lung in anesthetized rats. *Am J Physiol.*, **270(2 Pt 1)**, L232-41 (1996).
6. El-Zaim, H.S., et al., Protection against exotoxin A (ETA) and *Pseudomonas aeruginosa* infection in mice with ETA-specific antipeptide antibodies. *Infect. Immun.*, **66(11)**, 5551–5554 (1998).

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