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ProductInformation

α-Hemolysin
from *Staphylococcus aureus*

Catalog Number **H9395**
Storage Temperature 2-8 °C

CAS RN ; 94716-94-6
Synonym : α-Toxin

Product Description

Molecular weight : 33 kDa[1,2]
Extinction Coefficient : $E^{1\%}$ = 11 (280 nm)[3]
pI : 8.5[1]

α-Hemolysin is an extracellular protein secreted by most strains of pathogenic *Staphylococcus aureus*. It is selectively hemolytic and has a marked preference for rabbit red blood cells. It induces dermonecrosis, spastic muscle paralysis, and is lethal to laboratory animals.[1] The mature protein contains 293 residues and has a molecular weight of 33,000.[1] It is composed primarily of β-sheets (65%), while the α-helical structures are a much smaller percentage (10%).[1]

α-Hemolysin is secreted as a water-soluble monomer which initially binds and incorporates into the target cell membrane. At low concentrations, the binding is through a specific receptor, while at high concentrations, α-hemolysin nonspecifically adheres to the cell membrane.[1] Upon contact with lipid bilayers or the detergent deoxycholate, the monomers assemble to form an heptameric pore with a vestibule of 3 nm and a pore-diameter of 1.5 nm.[4,5] This pore allows rapid efflux of K^+ and small molecules, and influx of Na^+, Ca^{2+}, and molecules with molecular weights less than 1,000.[1,2] Osmotic swelling of erythrocytes finally results in rupture.[1] The Ca^{2+} influx in endothelial cells can result in arachidonic acid metabolism which finally leads to vasoconstriction.[1] α-Toxin effects on platelets can lead to procoagulation via Ca^{2+} influx.[1]

Reagent

Lyophilized powder containing sodium citrate buffer

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 in deionized water (0.5 mg/ml), yielding a colorless, faint hazy solution.

Storage/Stability

Store at 2-8 ^{0}C. Under these conditions the product is stable for 3 years.

References

1. Dinges, M. M. et al., Exotoxins of *Staphylococcus aureus*. *Clin. Microbiol. Rev.*, **13**, 16-34 (2000).
2. Fink, D. et al., *Staphylococcus aureus* α-toxin activates phospholipases and induces a Ca^{2+} influx in PC12 cells. *Cell Signal.*, **1**, 387-393 (1989).
3. Harshman, S., et al., Preparation and purification of staphylococcal α-toxin. *Methods Enzymol*. **165**, 3-7 (1988).
4. Gouaux, E. J. et al., Subunit stoichiometry of staphylococcal α-hemolysin in crystals and on membranes: A heptameric transmembrane pore. *Proc. Natl. Acad. Sci. USA*, **91**, 12828-12831 (1994).
5. Stefureac, R. et al., Transport of α-helical peptides through α-Hemolysin and aerolysin pores. *Biochemistry*, **45**, 9172-9179 (2006).

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