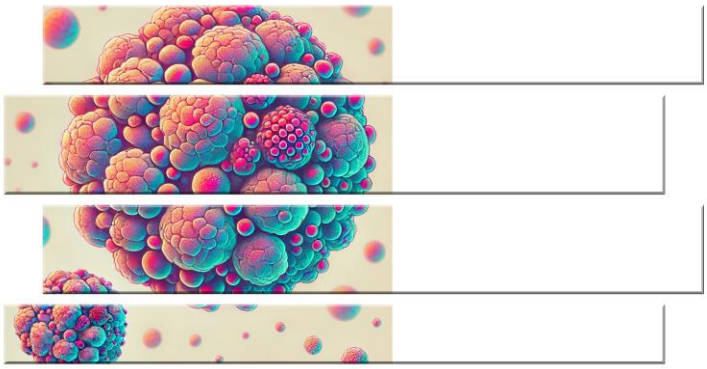

TriDix Bio
INNOVATING DRUG DISCOVERY

PRODUCT DATA SHEET

Listeriolysin-O, Listeriolysin-O, LLO Protein

SKU: TDD-8003

Product Details

Catalog Number: TDD-8003

Organism: Listeria monocytogenes serovar 1/2a (Uniprot: P13128)

Protein Type: Recommbinant

Protein Construction: LLO(Uniprot: P13128) expressed with c-terminal 6xHis tag.

Purity: >96% SDS-PAGE; ⩾ 98 % as determined by SEC

Expression System: Escherichia coli

Applications: Moleculare delivery; Antibody production and detection

Biologically active: Yes

Storage buffer: 20 mM Tris-HCl, pH 8.0, 150 mM NaCl

Endotoxin < 1.0 EU per μg protein as determined by the LAL method.

Storage Conditions & Shipment

Storage: -80℃ for long term storage; avoid freeze / thaw cycle

Product Format/Shipped: Dry ice

Safety Precaution

PLEASE READ BEFORE HANDLING ANY FROZEN VIALS. *This product is an active protein and may elicit a biological response in vivo. Please wear appropriate Personal Protection Equipment (lab coat, thermal gloves, safety goggles and a face shield) when handling.*

Description

Listeriolysin O (LLO) is a cytolytic toxin produced by the bacterium Listeria monocytogenes, a Gram-positive pathogen responsible for causing listeriosis, a foodborne infection. LLO is a key virulence factor that enables the bacterium to escape from the phagosome (a vacuole containing the engulfed bacterium) into the host cell cytoplasm, where it can replicate and spread.

Listeriolysin O (LLO) is a crucial toxin produced by Listeria monocytogenes, enabling the bacterium to escape the host immune response by disrupting the phagosomal membrane and allowing bacterial survival and replication within the host. It is an important virulence factor and a potential target for therapeutic and preventive strategies against listeriosis.

Sequence Infomation

Amino acid sequence

MKKIMLVFITLILVSLPIAQQTEAKDASAFNKENSISSMAPPASPPASPKTPIEKK
HADEIDKYIQGLDYNKNNVLVYHGDAVTNVPPRKGYKDGNEYIVVEKKKKSIN
QNNADIQVVNAISSLTYPGALVKANSELVENQPDVLPVKRDSLTLSIDLPGMTN
QDNKIVVKNATKSNVNNAVNTLVERWNEKYAQAYPNVSAKIDYDDEMAYSES
QLIAKFGTAFKAVNNSLNVNFGAISEGKMQEEVISFKQIYYNVNVNEPTRPSRF
FGKAVTKEQLQALGVNAENPPAYISSVAYGRQVYLKLSTNSHSTKVKAAFDAA
VSGKSVSGDVELTNIIKNSSFKAVIYGGSAKDEVQIIDGNLGDLRDILKKGATFN
RETPGVPIAYTTNFLKDNELAVIKNNSEYIETTSKAYTDGKINIDHSGGYVAQFNI
SWDEVNYDPEGNEIVQHKNWSENNKSKLAHFTSSIYLPGNARNINVYAKECT
GLAWEWWRTVIDDRNLPLVKNRNISIWGTTLYPKYSNKVDNPIEHHHHHH*

Protein length: Full Length

Amino acids: 1 to 529

Product Data

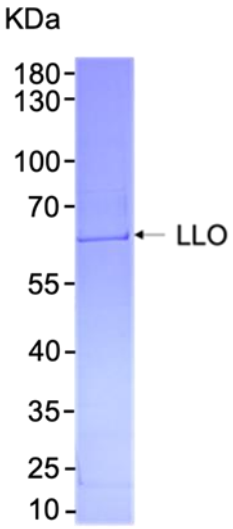

Figure 1, 1ug LLO Protein 2ug by SDS-PAGE under reducing condition and visualized by coomassie blue stain.

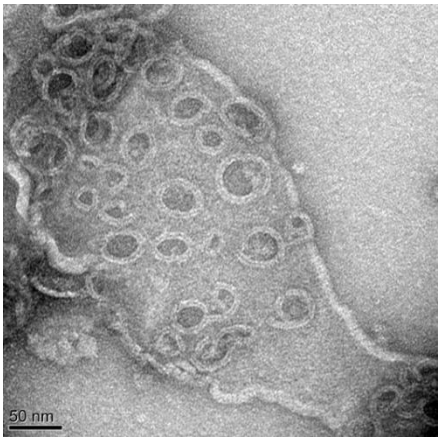

Figure 2, TEM of Listeriolysin O pore: ransmission Electron Microscopy (TEM) image (Left) shows the formation of Listeriolysin O (LLO) pores in a lipid bilayer. The image illustrates the ability of LLO to insert into the membrane and form pores, as indicated by the characteristic membrane disruption and perforations. These pores are critical for the cytolytic activity of LLO, allowing the escape of Listeria monocytogenes from the phagosomal compartment into the host cell cytoplasm. The scale bar represents 50 nm.

Biological Activity

Hemolytic activity for Recombinant Listeriolysin O was 1.18 x 10^5 HU/mg of protein where HU means hemolytic activity unit that is the amount of toxin needed to release half the hemoglobin (50% lysis) of the erythrocytes as determined by hemolysin assay.
2mM DTT is used to reactivate the toxin.

Applications

1. **Vaccine Development:**
   LLO is used as a vaccine adjuvant to enhance immune responses. It can help dstimulate both innate and adaptive immune systems, boosting the overall efficacy of vaccines. LLO is used in vaccine formulations to deliver antigens into host cells. By forming pores in the host cell membranes, LLO helps deliver antigens directly into the cytoplasm, where they can be processed and presented to the immune system, leading to a stronger immune response. LLO has been explored in Listeria-based vaccine platforms. These vaccines use live Listeria bacteria that express the target antigen and LLO, which facilitates intracellular delivery of the antigen to induce cell-mediated immunity.

2. **Gene Delivery Systems:**
   Lipid Vesicle-Mediated Delivery: LLO is utilized in gene delivery systems to improve the transfer of DNA or RNA into cells. Its pore-forming ability helps facilitate the entry of genetic material into the cytoplasm, enabling gene therapy applications.
   Gene Editing: LLO has been studied as part of CRISPR-Cas9 delivery systems. Its ability to disrupt membranes aids in the efficient transfer of the CRISPR components into target cells, enhancing gene-editing efficiency.

3. **Cell Biology and Membrane Permeabilization:**
   Membrane Permeabilization: LLO is a powerful tool for studying membrane dynamics and lipid bilayer interactions. It is used in research to understand membrane disruption, pore formation, and membrane fluidity in model systems such as lipid bilayers or liposomes.
   Intracellular Trafficking Studies: By disrupting membranes, LLO can be used to investigate how intracellular trafficking and vesicle fusion occur within cells, especially in the context of phagocytosis and endocytosis.

4. **Immunotherapy:**
   Tumor Immunotherapy: LLO is explored in cancer immunotherapy to enhance immune responses against tumors. LLO-based immunotoxins can be designed to selectively kill cancer cells or activate immune cells to target tumor tissues.
   Toxin Fusion Proteins: LLO is used in fusion proteins with other proteins or toxins to selectively deliver toxic agents to cancer cells or infected cells, exploiting its membrane-permeabilizing property to facilitate targeted killing.

5. **Research on Bacterial Pathogenesis:**
   Pathogenesis Studies: LLO is a critical virulence factor of Listeria monocytogenes, and it is studied to understand how Listeria escapes from phagosomes and spreads within host tissues. It is used to model host-pathogen interactions and the mechanisms behind intracellular bacterial survival.
   Studying Pore Formation: LLO is a representative example of pore-forming toxins (PFTs), and studying its structure and activity helps researchers understand the general mechanism of pore formation and membrane lysis by other bacterial toxins.

6. **Drug Delivery and Nanomedicine:**
   Nanocarrier Systems: LLO has been studied as a part of nanocarrier systems for drug delivery. By incorporating LLO into lipid-based nanoparticles, it can be used to

enhance the intracellular delivery of drugs, including chemotherapeutic agents or antibiotics, to increase their efficacy.
Targeted Drug Delivery: LLO can be employed in targeted drug delivery strategies where it helps to release therapeutic agents inside specific cells or tissues by forming pores that facilitate the uptake of the drugs.

Reference:

1. Geoffroy C, Gaillard JL, Alouf JE, Berche P. Purification, characterization, and toxicity of the sulfhydryl-activated hemolysin listeriolysin O from Listeria monocytogenes. Infect Immun. 1987 Jul;55(7):1641-6. doi: 10.1128/iai.55.7.1641-1646.1987. PMID: 3110067; PMCID: PMC260571.
2. Dramsi S, Cossart P. Listeriolysin O: a genuine cytolysin optimized for an intracellular parasite. J Cell Biol. 2002 Mar 18;156(6):943-6. doi: 10.1083/jcb.200202121. Epub 2002 Mar 18. PMID: 11901162; PMCID: PMC2173465.

Disclaimers

This product is intended for laboratory research use only. It is not intended for any animal or human therapeutic use, any human or animal consumption, or any diagnostic use.

Product Promise

At TriDix Bio, we are dedicated to supporting your work with high quality products. In the unlikely event of one of our products not working as expected, you are covered by our product promise.