

## Active Recombinant *Listeria monocytogenes* hly protein

Cat. No. hly-241 Lot. No. (See product label)

### SPECIFICATION

**Product Overview** Recombinant *Listeria monocytogenes* hly was expressed in *E. coli*.

**Species** *Listeria monocytogenes*

**Source** *E. coli*

#### Description

Listeriolysin O (aka LLO) is a hemolysin produced by *Listeria monocytogenes* bacteria, the pathogen responsible for causing listeriosis. The toxin may be regarded as a virulence factor, since it is crucial for the virulence of *L. monocytogenes*. LLO is a single polypeptide protein encoded by the *hlyA* gene and composed of 529 residues. LLO is a thiol-activated cholesterol-dependent pore forming toxin protein; therefore, it is activated by reducing agents and inhibited by oxidizing agents. Still, LLO differs from other thiol-activated toxins, as its cytolytic activity is maximized at a pH of 5.5. Inside the acidic phagosomes (average pH ~ 5.9) of cells that have phagocytosed *L. monocytogenes*, LLO is selectively activated by maximizing activity at a pH of 5.5. Following the phagosome lysis by LLO, the bacterium breaks out into the cytosol, where it is able to grow intracellularly, and the toxin has reduced activity in the more basic cytosol. Thus, LLO permits *L. monocytogenes* to break out from the phagosomes into the cytosol without harming the plasma membrane of the infected cell, which allows the bacteria to live intracellularly, where they are sheltered from extracellular immune system factors such as the complement system and antibodies. LLO also brings about dephosphorylation of histone H3 and deacetylation of histone H4 in the early phases of infection, before entry of *L. monocytogenes* into the host cell. The pore-forming activity is not implicated in causing the histone modifications.

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The modifications of the histones affect the down regulation of genes encoding proteins involved in the inflammatory response. Therefore, LLO may be significant in subverting the host immune response to *L. monocytogenes*. At its NH<sub>2</sub>-terminus it possesses a 25 residues long typical signal sequence excited during the secretion process. Moreover, in its NH<sub>2</sub>-terminus there is also a 19 amino acids PEST- like sequence that may target this toxin for degradation. The PEST-like sequence found in LLO and is considered crucial for virulence, given that mutants lacking the sequence lysed the host cell. Nevertheless, contrary to PEST's supposed role in protein degradation, evidence implies that the PEST-like sequence may control LLO production in the cytosol rather than increase degradation of LLO.

**Form**

Sterile Filtered clear solution. The protein contains 50mM NaH<sub>2</sub>PO<sub>4</sub>, 1mM EDTA, 2.7mM KCl, 1mM DTT, 5% (v/v) glycerol and 0.5M NaCl.

**Bio-activity**

Hemolytic activity for Recombinant Listeriolysin O was  $1.18 \times 10^5$  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.

**Molecular Mass**

58kDa

**Purity**

Greater than 90.0% as determined by SDS-PAGE.

**Applications**

a. Cytosolic delivery of molecules, peptides, oligonucleotides and plasmid DNA. b. Production of specific monoclonal antibodies. c. Detection of anti-listeriolysin O antibodies.

**Stability**

Store at 4 centigrade if entire vial will be used within 2-4 weeks. Store, frozen at -20 centigrade for longer periods of time. Avoid multiple freeze-thaw cycles.

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## GENE INFORMATION

**Gene Name** hly listeriolysin O precursor [ *Listeria monocytogenes* EGD-e ]

**Official Symbol**

**Synonyms** Listeriolysin-O, LLO, hlyA


**Gene ID** 987033

**mRNA Refseq**

**Protein Refseq** NP\_463733

**MIM**

**UniProt ID** P13128

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