ALPHA DIAGNOSTIC INTERNATIONAL

LIFE TECH Life Technologies™ Your Molecular & Cell Technology Partner

Product Specification Sheet

Bacillus anthracis Cell Wall

Cat. # CWBA-1	*Bacillus anthracis* Cell Wall, partially pure	**SIZE**: 1 mg
Cat. # CWBA-5	*Bacillus anthracis* Cell Wall, partially pure	**SIZE**: 5 mg

The bacterial cell wall is essentially a bag-shaped exoskeleton that ensures cell integrity and provide mechanical strength to the entire cell. The cell wall plays a key role in the regulation of exchanges between the cell and its surrounding environment. In Gram-positive bacteria, the proteins immobilized on the cell surface are involved in crucial physiological processes, such as cell wall assembly, and the breakdown of large non-transportable nutrient polymers into smaller subunits. In pathogenic bacteria, cell surface proteins are involved in various steps of the infection process: adhesion and/or invasion of host cells, binding to host molecules (immunoglobulins, serum or extracellular matrix proteins) and protection against phagocytosis. The cell wall is composed of peptidoglycan, a complex heteropolysaccharides made of glycan chains linked by small peptides. It forms a net covering the entire bacterium, representing up to 40% of the cell mass. Glycan chains consist of alternating units of N-acetylglucosamine and N-acetylmuramic acid. Glycan chains are linked together by the small peptides forming stacks of glycan in the cell wall

During evolution, Gram-positive bacteria have developed various strategies for displaying proteins at their surface. The best characterized mechanism is the covalent binding of LPXTG-carrying proteins to the peptidoglycan pentaglycine cross-bridge. This mechanism requires a C-terminal sorting signal with an LPXTG motif, a hydrophobic domain interacting with the cytoplasmic membrane, a charged tail preventing secretion and a sortase, which catalyzes the transpeptidation reaction.

Fully virulent bacilli are encapsulated with poly-gamma-D-glutamic acid. Under the capsule, the cell is covered by two proteins, (extractable antigen 1) and Sap (surface array protein), forming the surface or S-layer. S-layer homology (SLH) domains on these proteins bind noncovalently to polysaccharides in the underlying cell wall. SLH modules (or 'motifs') are ~55 residues, containing 10–15 conserved amino acids, referred to as the SLH (S-layer homology) domain. SLH domains, composed of one or three modules, have been found in >40 proteins from Gram-positive bacteria, and also from some Gram-negative bacteria. S-layer proteins lacking the SLH domain do not bind to cell walls. The amino acid composition of the SLH domain is typical of carbohydrate-binding proteins such as lectins and removal of carbohydrate abolished the SLH domain binding.

Source of Protein

B. anthracis cell wall is prepared by lysing the cells in buffer containing detergents. It is provided as 1 mg or 5 mg size in powder form. It contains 4-5 umol amino acid per mg. Reconstitute the powder in the required buffer at ~1 mg/ml. Solubility may be increased by Sonication. Alternatively, cell wall may be dissolved in a buffer containing 0.5-2% SDS or non-ionic detergent such as NP-40 (0.51%) or other detergents depending upon the usage. Store powder or liquid at at -70oC or below.

General References Navarre S (1999) Microbiol Mol Biol Rev, 63, 174–229; Cossart P (2000) Proc Natl Acad Sci USA, 97, 5013; Stahl S (1997) Trends Biotechnol, 15, 185–192; Schneewind O (1992) Cell, 70, 267-281

Mesnage S (2000) EMBO J 19, 4473; Tobias S et al (2003) JBC 10.1074, D. Borden Lacy et al (2002) JBC Vol. 227, 3006-3010; Kristina Cunningham et al (2002) PNAS Vol.99, 7049-7053; Jeremy Mogridge et al (2002) PNAS Vol.99, 7045-7048.

Storage

Short-term: unopened, undiluted vials for less than a week at 4oC.

Long-term: at –20C or below in suitable aliquots after reconstitution. Do not freeze and thaw and store working, diluted solutions.

Stability: 6-12 months at –20oC or below.

Shipping: 4oC for solutions and room temp for powder.

MSDS: Anthrax proteins (LF, PA, and EF) are produced by plasmids from a non-sporulating avirulent strain of Bacillus anthracis which lacks both of the wild type plasmids, pX01 and pX02. This host makes none of the anthrax toxin components and no polygutamate capsule. Thus, the anthrax toxin components produced are single, pure proteins lacking all other virulence factors. Individually, each protein is non-toxic and presents no hazard during normal laboratory use. However, normal GLP procedures should be observed when handling this product and all areas cleaned after usage.

**This product is for In vitro research use only.*

Related materials available from ADI

Antibodies: Anthrax receptors ATR11-A, ATR12-A, ATR31-A, Protective antigen A, Spore Antigen Edema factor etc.

EF25-R	Recombinant Anthrax toxin Edema Factor protein
LF11-M	Monoclonal Anti-Anthrax Lethal factor antigen IgG #1
LF12-MB	Monoclonal Anti- (LF) protein IgG biotinylated
LF15-R	Purified Recombinant Anthrax Lethal Factor protein
LFPI-4	Lethal factor protease Inhibitor-1, Cell permeable,
LFPS-1	Lethal factor Protease Substrate 1,
LFPS-2	Lethal factor Protease Substrate 2, pNA derivative
LFPS-3	Lethal factor Protease Substrate 3, AMC derivative
PA12-M	Monoclonal Anti-Anthrax Protective antigen IgG # 2
PA12-MB	Monoclonal Anti- Protective antigen (PA) IgG biotinylated
PA63-R	Purified Recombinant Anthrax Protective Antigen (63kD)
PA83-R	Purified Recombinant Anthrax Protective Antigen (83 kD)
SA12-M	Monoclonal Anti- Spore extract antigen IgG # 2, aff pure

ELISA kits to detect anti-LF, Anti-PA, Anti-EF antibodies in mouse, goat immunized with the recombinant proteins or vaccines

CWBA-1-5 80128A

Alpha Diagnostic Intl Inc., 6203 Woodlake Center Dr, S an Antonio, T X 7 8 24 4 , U S A;

India Contact:

Life Technologies (India) Pvt. Ltd.

306, Aggarwal City Mall, Opposite M2K Pitampura, Delhi – 110034 (INDIA). Ph: +91-11-42208000, 42208111, 42208222, Mobile: +91-9810521400 Fax: +91-11-42208444 Email: customerservice@lifetechindia.com Website: www.lifetechindia.com