ALPHA DIAGNOSTIC INTERNATIONAL

Product Specification Sheet

Diphtheria Toxoid Protein

Cat # DTOX15-N-500 Purified Diphtheria Toxoid protein (antigen grade) **Size**: ☐ 100 ug

Diphtheria is a localized infection of mucous membranes or skin caused by toxigenic strains of CORYNEBACTERIUM DIPHTHERIAE. It is characterized by the presence of a pseudomembrane at the site of infection. DIPHTHERIA TOXIN, produced by C. diphtheriae, can cause myocarditis, polyneuritis, and other systemic toxic effects. Diphtheria toxin is an exotoxin secreted by Corynebacterium diphtheriae, the pathogen bacterium that causes diphtheria. Diphtheria toxin is a single polypeptide chain of 535 amino acids (~63 kda) consisting of two subunits linked by disulfide bridges. An ADP-ribosylating polypeptide produced by CORYNEBACTERIUM DIPHTHERIAE that causes the signs and symptoms of DIPHTHERIA. It can be broken into two unequal domains: the smaller (24 kda), catalytic A domain is the lethal moiety and contains MONO(ADP-RIBOSE) TRANSFERASES which transfers ADP RIBOSE to PEPTIDE ELONGATION FACTOR 2 thereby inhibiting protein synthesis; and the larger B domain (39 kda) that is needed for entry into cells. Binding to the cell surface of the less stable of these two subunits allows the more stable part of the protein to penetrate the host cell. It catalyzes the ADP-ribosylation of eukaryotic elongation factor-2 (eEF2), inactivating this protein. It does so by ADP-ribosylating the unusual aminoacid diphthamide. In this way, it acts as a RNA translational inhibitor. The exotoxin A of Pseudomonas aeruginosa uses a similar mechanism of action. Diphtheria toxin is extraordinarily potent.[1] The lethal dose for humans is about 0.1 µg of toxin per kg of bodyweight. A massive release of toxin into the body will likely cause lethal necrosis of the heart and liver. Diphtheria Toxoid is formaldehyde-inactivated toxin of Corynebacterium diphtheriae. It is generally used in mixtures with TETANUS TOXOID and PERTUSSIS VACCINE; (DTP); or with tetanus toxoid alone (DT for pediatric use and Td, which contains 5- to 10-fold less diphtheria toxoid, for other use). Diphtheria toxoid is used for the prevention of diphtheria; DIPHTHERIA ANTITOXIN is for treatment.

Mutant forms of diphtheria toxin (DT), cross-reactive material 197 (CRM 197) is a non-toxic DT mutant containing a lesion in the A chain blocking ADP-ribosylation. CRM results from a single base change in the structural gene resulting in the substitution of glutamic acid for glycine. While CRM shows no enzymatic activity, it is immunologically indistinguishable from diphtheria toxin. In its applications, CRM 197 is similar to diphtheria toxoid. CRM has the advantage of being a well defined protein in contrast to formaldehyde treated toxin (toxoid) which is non-specifically cross linked and subject to rearrangement. CRM functions as a carrier for polysaccharides and haptens making them immunogenic.

Source of Antigen

Diphtheria toxin, obtained from C. diphtheriae Park Williams strain 8, purified (>95%, a single major band on SDS-PAGE under non reducing condition, ~63 kda; two smaller subunits of 39 Kda and 24 kda). The toxin is treated with formaldehyde to make the toxoid. Diphtheria toxoid is supplied in a buffer (10 mM phosphate buffer, pH 7.5, 0.1 mg/mL sorbitol) as lyophilized powder. Reconstituted with distilled water. Store powder at -20oC and it is stable for at least 1 year. Store reconstituted solution at -20oC or below in suitable size aliquots.

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

Recommended Usage

Purified protein can be used for ELISA, Western, antibody titration or as control protein for adjuvant.

General References: Honjo J (1968) JBC 243, 3553; Gill Dm (1969) J. Exp. Med. 129, 1-21; Bowman JB (1970) J. Exp. Med. 132, 1138; Uchida T (1972) Science 175, 901-903; Holmes RK (2000) J. Infect. Dis. 181, S156; Robbins JB (1990) J. Infect. dis. 161, 821-832**;**

This product is for in vitro research use only.

Related material available from ADI

Diphtheria Toxoid, Toxin (whole), subunits A and B

Antibodies to subunits A and B

ELISA Kits for the detection of anti-Diphtheria Toxoid IgG in rabbit, mouse, and human.

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