

Recombinant Bordetella Pertussis Adenylate Cyclase

Cat. No. BOP-020 **Lot. No.** (See product label)

SPECIFICATION

Product Overview

Adenylate cyclase is a toxin produced by a gram-negative coccobacillus, *Bordetella pertussis*. This toxin penetrates into the animal cells and produces cAMP from ATP in the cytoplasm. It belongs to the RTX family of toxins produced by many gram-negative bacteria.

Background

Adenylate cyclase toxin is a virulence factor produced by some members of the genus *Bordetella*. Together with the pertussis toxin it is the most important virulence factor of the causative agent of whooping cough, *Bordetella pertussis*. Gene analysis has shown that adenylate cyclase is synthesized as a large precursor of 1706 amino acids. The protein consists of three domains: from the N-terminus up to roughly residue 400, there is an adenylate-cyclase domain; between residues 500 and 700, there is a hydrophobic domain; and from residue 1000 to the C-terminus, there are calcium binding repeats. The calmodulin-stimulated catalytic activity resides in the amino-terminal 400 amino acids whereas the 1300 amino acid carboxy-terminal part of the precursor is endowed with haemolytic activity. The catalytically active 43 kDa form of adenylate cyclase is organized in two domains: the N-terminal domain of 25 kDa harbors the catalytic site, and the 18 kDa C-terminal domain carries the main calmodulin-binding site (Glaser et al., 1988).

The toxin is secreted by the Type I secretion system, which spans both membranes and periplasm space, allowing it to be secreted from the cytoplasm directly outside the cell which then binds to target cells by the complement receptor 3 (CD11b/CD18, or Mac-1). These properties have been exploited to engineer the toxin as a potent non-replicating vector able to deliver antigens into antigen presenting cells and elicit specific cell-mediated immune responses. Antigens of interest can be inserted into

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the toxin protein to yield recombinant molecules that are targeted in vivo to dendritic cells, where the antigens are processed and presented by the major class I and class II histocompatibility complexes (MHC-I and II) (Chenal et al., 2018).

Purity

90% purity by SDS-PAGE.

Notes

This product is intended for research and manufacturing uses only. It is not a diagnostic device. The user assumes all responsibility for care, custody and control of the material, including its disposal, in accordance with all regulations.

Type

Recombinant

ClassID 1

Infectious Disease

GENE INFORMATION**Synonyms**

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