



Product Specification Sheet

Purified Cholera Toxin protein (antigen/vaccine grade)

- | | | |
|---|--|---------------------|
| <input type="checkbox"/> Cat. AV-9135-500 | Purified Cholera Toxin protein (antigen/vaccine grade) | SIZE: 500 ug |
| <input type="checkbox"/> Cat. AV-9135-1000 | Purified Cholera Toxin protein (antigen/vaccine grade) | SIZE: 1 mg |

General Information: The word 'adjuvant' is derived from the Latin word 'adjuvare' which means 'to help'. Therefore, Immunologic Adjuvants are added to vaccines to stimulate the immune system's response to the target antigen, but do not in themselves confer immunity. Adjuvants act in various ways in presenting an antigen to the immune system. Adjuvants can act as a depot for the antigen, presenting the antigen over a long period of time, thus maximizing the immune response before the body clears the antigen. Examples of depot type adjuvants are oil emulsions. Adjuvants can also act as an irritant which causes the body to recruit and amplify its immune response. A tetanus, diphtheria, and pertussis vaccine, for example, contains minute quantities of toxins/toxoids produced by each of the target bacteria. The body's immune system develops an antitoxin to the bacteria's toxins, not to the aluminum, but would not respond enough without the help of the aluminum adjuvant. Adjuvants have also evolved as substances that can aid in stabilizing formulations of antigens, especially for vaccines administered for animal health.

Adjuvants augment the effects of a vaccine by stimulating the immune system to respond to the vaccine more vigorously, and thus providing increased immunity to a particular disease. Adjuvants accomplish this task by mimicking specific sets of evolutionarily conserved molecules, so called PAMPs, which include liposomes, lipopolysaccharide (LPS), molecular cages for antigen, components of bacterial cell walls (e.g., flagellins), and endocytosed nucleic acids such as double-stranded RNA (dsRNA), single-stranded DNA (ssDNA), and unmethylated CpG dinucleotide-containing DNA (ODNs). Natural proteins such as ovalbumin or OVA-peptides and key hole limpet hemocyanins (KLH) are also being explored not only serve as carrier protein but also as adjuvants. Because immune systems have evolved to recognize these specific antigenic moieties, the presence of an adjuvant in conjunction with the vaccine can greatly increase the innate immune response to the antigen by augmenting the activities of dendritic cells (DCs), lymphocytes, and macrophages by mimicking a natural infection. Furthermore, because adjuvants are attenuated beyond any function of virulence, they pose little or no independent threat to a host organism.

For human vaccines, aluminum hydroxide (Alum) based adjuvants (Aluminum hydroxide or Alhydrogel; Aluminium phosphate or Adjuphos) are the only **FDA-approved adjuvants**. Vaccine components that are formulated in Alum are called "Adsorbed Vaccines". The effectiveness of each salt as an adjuvant depends on the characteristics of the specific vaccine and how the manufacturer prepares the vaccine

Not all vaccines contain Alum because an adjuvant may not have been needed, was not expected to increase the desired immune response, or was going to cause an imbalance in the immune response. For example, **inactivated Polio Virus (IPV/IPOL)** vaccine, measles, mumps and rubella vaccine (**MMR/MMRII/MMRV**), **Varicella or chickenpox vaccine (Varivax/Proquad/MMRV)**, **Meningococcal conjugate (MCV4/Menomune/Menactra)** vaccine, and **influenza vaccines (Fluzone/Flulaval/Flumist/Fluvirin etc)** do not contain aluminum salts.

Product Information

The cholera toxin (*Vibrio cholerae*) is an oligomeric complex made up of six protein subunits: a single copy of the A subunit (part A, enzymatic), and five copies of the B subunit (part B, receptor binding), denoted as AB₅. Subunit B binds while subunit A activates the G protein which activates adenylate cyclase. The three-dimensional structure of the toxin was determined using X-ray crystallography by Zhang et al. in 1995.

The five B subunits—each weighing 11 kDa, form a five-membered ring. The A subunit which is 28 kDa, has two important segments. The A1 portion of the chain (CTA1) is a globular enzyme payload that ADP-ribosylates G proteins, while the A2 chain (CTA2) forms an extended alpha helix which sits snugly in the central pore of the B subunit ring.

Because the B subunit appears to be relatively non-toxic, researchers have found a number of applications for it in cell and molecular biology. It is routinely used as a neuronal tracer.

Storage and Stability: Shipped at room temperature and it should be stored at 2-8 C. Long term storage at -20 C for up to 6 months. Avoid repeated freeze thaw cycles.

References: Ryan KJ (2004). Sherris Medical Microbiology (4th ed.). McGraw Hill. Zhang R, Scott D (1995 J Mol Biol 251 (4): 563–73. Androutsellis-Theotokis A(2010) PLoS ONE 5 (5): e10841

Related items:

Catalog# ProdDescription

- | | |
|--------------|---|
| AV-9030-50 | Poly(I:C) (Polyinosinic-Polycytidylic) Synthetic |
| AV-9105-25 | Tetanus Toxoid from <i>C. tetani</i> purified, vaccine grade |
| AV-9110-10 | Recombinant purified tetani toxin Light-chain (Non toxic) |
| AV-9115-10 | Recombinant (<i>P. fluorescens</i>) purified tetani toxin C-terminal fragment (~52 Kda, >95% pure, low endotoxin) |
| AV-9120-500 | Purified Diphtheria Toxoid protein antigen grade |
| AV-9125-100 | Purified CRM197 (Diphtheria Toxin mutant) protein vaccine grade |
| AV-9130-50 | Pertussis Toxin B.Pertussis, vaccine grade |
| AV-9135-1000 | Purified Cholera Toxin protein; vaccine grade |
| AV-9135-500 | Purified Cholera Toxin protein; vaccine grade |
| AV-9140-100 | Purified Recombinant Anthrax Protective Antigen (83 kD) (Non toxic), vaccine grade |
| AV-9140-1000 | Purified Recombinant Anthrax Protective Antigen (83 kD) (Non toxic), vaccine grade |
| AV-9145-10 | Purified Pasteurella multocida Toxin (146 kda), vaccine grade |
| AV-9150-10 | Purified Exotoxin A from <i>P. aeruginosa</i> , vaccine grade |

Complete list is available at:
http://4adi.com/objects/catalog/product/extras/Vaccine_Adjuvants_flr.pdf

AV-9135-1000 140516P