ALPHA DIAGNOSTIC INTERNATIONAL

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Product Specification Sheet

Dinitrophenyl (DNP)-Lipopolysaccharide (LPS) Conjugate

☐ **Cat. #.** AV-9340-1 Dinitrophenyl (DNP)-Lipopolysaccharide (LPS) Conjugate **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

Dinitrophenyl (DNP) is a hapten that is often used for labeling primary or secondary probes in immunological assays. Small molecules (Haptens) such as small chemicals or drugs or antibiotics or peptides must be coupled to a large carrier protein (BSA, Ovalbumin, thyroglobulin, toxoids etc) to make antibodies.

Much of our current understanding of the antibody response to antigens has been derived by using the antibody-hapten model. One known model uses the dinitrophenyl (DNP) group. Immunization of many mammalian species with DNP-protein conjugates results in production of antibodies specific for DNP and the amino acid side chains to which it is attached.

Model antigens have typically been used to study the immune status of immune compromised animals or to compare the effect of added substances (adjuvant). A variety of model antigens can be used: Proteins (medium size such ovalbumin (45 kda) or BSA (65 kda), Thyroglobulin & KLH (>100 Kda-million Kda),

DNP-albumin or ovalbumin conjugates contains approx. 40 DNP/molecule of protein. DNP conjugates (DNP-KLH or DNP-BSA) useful for the production of antibodies specific for DNP and hemocyanin or BSA. DNP immunization produced a significant variation in the amount and antibody class (IgGs, IgA, IgE, IgM) among strains, and under various experimental conditions. DNP preparations (purity and supplier), doses (amount per injection), routes (intramuscular, intravenous, aerosol, liposome entrapped, polymerized etc), frequency of exposure (single injections, multiple etc) may induce a defined class of antibody and its level may vary as well. DNP-induced antibody production has been used to assess the immune status of normal and immune compromised animals.

2,4-Dinitrophenyl hapten is conjugated to Lipopolysaccharide (LPS). Studies showed that RML and nude mice stimulated with DNP-LPS produced only primary anti-DNP responses, whereas both primary and secondary anti-LPS responses were elicited by this conjugate

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: K.B. Von Eschen Immun. Vol 31, p 327 (1981). J.R. Goodlad Eur. J. Immunol. Vol 25, p 1918 (1995). B.A. Dimitriev FEMS Microbiol.Lett. Vol 61, p 39 (1991).

Related items:

Catalog#	ProdDescription
AV-9305-10	Keyhole Limpet Hemocyanin (Megathura Crenulata)
AV-9310-1000	Chicken egg ovalbumin protein (ELISA, antigen, allergy grade)
AV-9315-1	Ovalbumin peptide OVA (257-264) class I MHC molecule
AV-9320-1	Ovalbumin peptide OVA (323-339) MHC class II peptide
AV-9325-10	Dinitrophenyl (DNP)-KLH protein Conjugate
AV-9335-10	Dinitrophenyl (DNP)-Ovalbumin (OVA) protein Conjugate

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

AV-9340-1 140518P

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