

Product Specification Sheet

Lipopolysaccharides (LPS) vaccine adjuvant

<input type="checkbox"/> Cat. # AV-7015-1	Lipopolysaccharides (LPS) (Escherichia coli 0111:B4) vaccine adjuvant	SIZE: 1 mg
<input type="checkbox"/> Cat. # AV-7015-10	Lipopolysaccharides (LPS) (Escherichia coli 0111:B4) vaccine adjuvant	SIZE: 10 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 Adjuvphos) 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

Lipopolysaccharides (LPS) are characteristic components of the cell wall of Gram-negative bacteria. LPS and its lipid A moiety stimulate cells of the innate immune system by the Toll-like receptor 4 (TLR4), a member of the Toll-like receptor protein family, which recognizes common pathogen-associated molecular-patterns (PAMPs). This product is phenol extracted from *E. coli* serotype O111:B4. This LPS serotype has been used to stimulate B-cells22 and induce NOS in human hepatocytes. Bacteria with common serotypes have surface antigens (group O, group H, or LPS) which generate the same antibody response.

Appearance: Off white to faint yellow
Form: provided as a lyophilized powder; sterile.
Solubility: water (4.9-5.10 mg/ml), cell culture medium (1 mg/ml)
Turbidity: Slightly hazy
Prot. Content (%): 0.41
Potency: 600000 EU/mg

Suggested usage: The product is soluble in water (5 mg/ml) or cell culture medium (1 mg/ml) yielding a hazy, faint yellow solution. A more concentrated, though still hazy, solution (20 mg/ml) has been achieved in aqueous saline after vortexing and warming to 70-80 °C. For cell culture use, LPS should be reconstituted by adding 1 ml of sterile balanced salt solution or cell culture medium to a vial (1 mg) and swirling gently until the powder dissolves. Solutions can be further diluted to the desired working concentration with additional sterile balanced salt solutions or cell culture media.

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

References: Ding H. F(1990). 31(2), 95-102 ;Raetz (1985). Microbiology 18, 157-207

Related items:

AV-7000-PK-1 LPS/MPLA/MDP vaccine adjuvant Combo Pak-1 (contains 1 mg each of LPS (#AV-7015-1), MPLA-SM (#AV-7025-1) and MDP (#AV-7035-1);
 AV-7010-50 Recombinant flagellin FlicC vaccine adjuvant (TLR5 agonist); vaccine adjuvant
 AV-7016-1 Lipopolysaccharides (LPS) (Escherichia coli 0111:B4) vaccine adjuvant, ultrapure, TLR4 tested
 AV-7020-1 Lipopolysaccharides (LPS) (Salmonella enterica typhimurium) vaccine adjuvant
 AV-7025-1 Monophosphoryl lipid A (MPLA)-SM (S. enterica Minnesota, R595) vaccine adjuvant
 AV-7030-1 Monophosphoryl lipid A (MPLA) (Synthetic, TLR4/Th1) vaccine adjuvant
 AV-7035-1 MDP, muramyl dipetide (Ac-muramyl-Ala-D-Glu- amide) Synthetic; vaccine adjuvant
 AV-7040-1 Diphosphoryl Lipid A (E. coli K12 D31m4)
 AV-7045-5 Peptidoglycan (S. aureus); vaccine adjuvant

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

AV-7015-1 150115P

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