

## Product Specification Sheet

### Recombinant flagellin FlicC ,vaccine adjuvant (TLR5 agonist) vaccine adjuvant

□ **Cat. #** AV-7010-50      Recombinant flagellin FlicC, vaccine adjuvant (TLR5 agonist) vaccine adjuvant      **SIZE:** 50 ug

**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; Aluminum phosphate or Adjuvax) 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. To work as an adjuvant, the antigen must be adsorbed to the Alum to keep the antigen at the site of injection.

**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/MMRI/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

Flagellin FlicC is a recombinant flagellin protein encoded by the FlicC gene from *Salmonella typhimurium*. Gram-negative flagellin, a Toll-like receptor 5 (TLR5) agonist, is a potent inducer of innate immune effectors such as cytokines and nitric oxide unlike other TLR agonists, flagellin tends to produce mixed Th1 and Th2 responses rather than strongly Th1 responses. It has been demonstrated that flagellin can act as a potent adjuvant in flu vaccines. Furthermore, flagellin can also signal through the NLRC4 inflammasome. The plasticity of flagellin has allowed for the generation of a range of flagellin-Ag fusion proteins that have proven to be effective vaccines in animal models.

**Related vaccines:** *Y. pestis* F1 antigen Vaccine with Flagellin (*Yersinia pestis*)

**Formulation:** 50 mg of lyophilized Flagellin FlicC in 10 ml sterile endotoxin-free physiological water (NaCl 0.9%)

**Appearance:** White powder

**Storage and Stability:** Shipped at room temperature and it should be stored at room temp. DO NOT FREEZE. Stable for 6 months.

**Dosage :** intranasally (i.n.) or i.m. using a two-dose protocol (100–500 µg) rabbits.

**References:** Honko et al.,(2006) Infection and immunity. 74(2); 1113-1120. Huleatt J. et al.,( 2007). Vaccine 25(4):763-75.2.;Mbow ML. et al., (2010). Curr Op in Immuno. 22(3):411-6. 3. skountzoui. et al., (2010). Vaccine 28(4): 4103-12. 4. Miao eA (2010)J Clin Immunol. 30(4): 502-6

#### Related items:

Catalog#	ProdDescription
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-7015-1	Lipopolysaccharides (LPS) ( <i>Escherichia coli</i> 0111:B4) vaccine adjuvant
AV-7016-1	Lipopolysaccharides (LPS) ( <i>Escherichia coli</i> 0111:B4) vaccine adjuvant, ultrapure, TLR4 tested
AV-7020-10	Lipopolysaccharides (LPS) ( <i>Salmonella enterica typhimurium</i> ) vaccine adjuvant
AV-7025-5	Monophosphoryl lipid A (MPLA)-SM ( <i>S. enterica</i> Minnesota, R595) vaccine adjuvant
AV-7030-1	Monophosphoryl lipid A (MPLA) (Synthetic, TLR4/Th1) vaccine adjuvant
AV-7035-1	MDP, muramyl dipeptide (Ac-muramyl-Ala-D-Glu-amide) Synthetic; vaccine adjuvant
AV-7040-1	Diphosphoryl Lipid A ( <i>E. coli</i> K12 D31m4)
AV-7045-25	Peptidoglycan ( <i>S. aureus</i> ); vaccine adjuvant

Complete list is available at:

[http://4adi.com/objects/catalog/product/extras/Vaccine\\_Adjuvants\\_flr.pdf](http://4adi.com/objects/catalog/product/extras/Vaccine_Adjuvants_flr.pdf)

AV-7010-50      140514P

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