ALPHA DIAGNOSTIC INTERNATIONAL

Product Specification Sheet

TDB (Trehalose-6,6-dibehenate) Synthetic vaccine adjuvant

□ **Cat.** # AV-9015-2 TDB (Trehalose-6,6-dibehenate) Synthetic vaccine adjuvant **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; Aluminum 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. 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/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

Trehalose-6,6-dibehenate (TDB) is a synthetic analog of trehalose-6,6-dimycolate (TDM, also known as cord factor), which is the most studied immunostimulatory component of Mycobacterium tuberculosis.

TDB binds the C-Type lectin, Mincle (macrophage-inducible C-type lectin) Upon TDB recognition Mincle interacts with the Fc receptor common γ-chain (FcRγ), which triggers intracellular signaling through Syk leading to CARD9-dependent NF-κB activation.

CAS Number.: 66758-35-8
Formulation: $C_{56}H_{106}O_{13}$. C 68.12%, H 10.82%, O 21.06%
Appearance: Powder
Purity : >99%
Form: supplied as ready to use.

For in vitro research purpose only

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

Suggested Usage: (1mg/ml) Add 100 µl DMSO to 1 mg TDB, heat at 60°C (approx. 15 -30 seconds) and vortex.
- Once resuspended, immediately add 900 µl sterile phosphate buffered saline (PBS), heat for 10 - 15 minutes at 60°C and homogenize by vortexing for 30 seconds

Working concentration: 1 - 100 mg/ml

References: Ihikawa, e. et al., (2009). J. Exp. Med. 206, 2879–2888.; Schoenen, H. et al., (2010). J. Immunol. 184,2756–2760.. Werninghaus K. et al., (2009). J Exp Med. 16;206(1):89-97

Related items:

Catalog#	ProdDescription
AV-9000-PK-2	Synthetic Adjuvant Combo Pak-2 (contains 1 mg of Pam2csk4 (#AV-9020-1), 1 mg of Pam3csk4 (#AV-9025-1) and 1 mg of Poly(I:C) (#AV-9030)
AV-9010-1	RWJ 21757 Synthetic vaccine adjuvant
AV-9015-2	TDB (Trehalose-6,6-dibehenate) Synthetic vaccine adjuvant
AV-9020-1	Pam2CSK4 vaccine adjuvant
AV-9025-1	Pam3CSK4 vaccine adjuvant, unlabeled
AV-9030-10	Poly(I:C) (Polyinosinic-Polycytidylic) Synthetic

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

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