

## Product Specification Sheet

### Poly(I:C) (Polyinosinic-Polycytidylic) Synthetic

<input type="checkbox"/> <b>Cat. # AV-9030-10</b>	Poly(I:C) (Polyinosinic-Polycytidylic) Synthetic	<b>SIZE: 10 mg</b>
<input type="checkbox"/> <b>Cat. # AV-9030-50</b>	Poly(I:C) (Polyinosinic-Polycytidylic) Synthetic	<b>SIZE: 50 mg</b>

**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/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

Polyinosinic:polycytidylic acid (poly I:C) is an immunostimulant. It is used in the form of its sodium salt to simulate viral infections. Poly I:C is known to interact with toll-like receptor (TLR) 3, which is expressed in the membrane of B-cells, macrophages and dendritic cells. Poly I:C is structurally similar to double-stranded RNA, which is present in some viruses and is a "natural" stimulant of TLR3. Thus, Poly I:C can be considered a synthetic analog of double-stranded RNA and is a common tool for scientific research on the immune system. Double-stranded RNA, polyribonoininic-polyribocytidylic acid (poly IC), acts as an adjuvant that enhances adaptive immune responses.

Poly IC induces the secretion of type I IFNs, proinflammatory cytokines, and the maturation of DC. TLR3 recognizes poly IC in the endosome and initiates signaling through Toll/IL-1R domain-containing adaptor inducing IFN- $\beta$  (TRIF). There is a TLR3-independent cytoplasmic pathway for poly IC recognition. Retinoic acid-inducible gene I (RIG-I) and melanoma differentiation-associated gene 5 (Mda5) represent a family of RNA helicases that sense viral RNA in the cytoplasm. RIG-I recognizes the 5'-triphosphate end of RNA in various RNA viruses, whereas Mda5 recognizes poly IC. RIG-I and Mda5 signaling solely depends on an adaptor, IFN- $\beta$  promoter stimulator 1 (IPS-1) (MAVS/Cardif/VISA). Together, the host innate immune system employs at least two pathways for poly IC recognition

**Related vaccine :** Recombinant PA with Poly(I:C) Adjuvant (Bacillus anthracis)

**CAS No.** 42424-50-0

**Appearance:** white powder

**Average size:** 2 -10 kb

**Form:** Lyophilized

**Solubility:** Soluble in water up to 10 mg/ml.

**Working concentration:** 10-100 mg/mouse

**Storage and Stability:** Shipped at room temperature. Long term storage at -20 C for up to 6 months. Avoid repeated freeze thaw cycles.

**References:** Kumar et al.,(2008): Journal of immunology 180; 683-687. Sloat and Cui, (2006) Pharmaceutical research. 23(6); 1217-1226.

### Related items:

Catalog#	Prod Description
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, unlabelled
AV-9025-1	Pam3CSK4 vaccine adjuvant, unlabeled
AV-9025-B	Pam3CSK4 vaccine adjuvant; Biotin labelled
AV-9025-F	Pam3CSK4 vaccine adjuvant; FITC labelled

Complete list is available at:

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

AV-9030-10

151109SV

### India Contact:

#### Life Technologies (India) Pvt. Ltd.

306, Aggarwal City Mall, Opposite M2K Pitampura, Delhi – 110034 (INDIA). Ph: +91-11-42208000, 42208111, 42208222, Mobile: +91-9810521400, Fax: +91-11-42208444  
Email: [customerservice@lifetechindia.com](mailto:customerservice@lifetechindia.com) Website: [www.lifetechindia.com](http://www.lifetechindia.com)