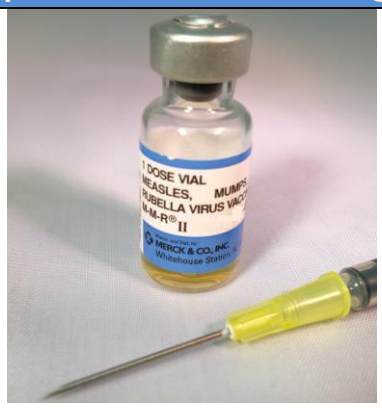
# Setting New Standards For Vaccine Development & Testing

*"The impact of vaccination on the health of the world's peoples is hard to exaggerate. With the exception of safe water, no other modality, not even antibiotics, has had such a major effect on mortality reduction and population growth."*




Since the early recognition of vaccines by Edward Jenner in 1796, millions of lives have been saved by a variety of bacterial and human vaccines. Until recently, most vaccines were aimed at infants and children, but adolescents and adults (e.g., obesity and drug abuse) are increasingly being targeted. New methods of administering vaccines such as skin patches, aerosols via inhalation devices, and eating genetically engineered plants. Attempts are being made to develop vaccines to help cure chronic infections, as opposed to preventing disease. Vaccines are being developed to defend against bioterrorist attacks such as anthrax, plague, and smallpox. Malarial alone kills millions every year. There is an urgent need to develop effective vaccines for Malaria and HIV etc.

Biotech and vaccine manufactures have paid more attention to produce vaccine but fewer companies have developed reliable tests to determine efficacy of vaccines in animals and humans. ADI is at forefront of developing newer tests for a variety of old and new vaccines. It is for the first time that one can identify and measure the vaccine after adsorbing it on Alum. This brochure presents a brief summary of antibodies, reagents and test methods available for various vaccines.



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# Vaccine & Drug Development: Custom Sample Testing

Drug and vaccine development requires not only the availability of appropriate test kits but efficient and timely testing of animal and human samples. Over the last 20-years, ADI has researched and developed 100s of unique ELISA kits for autoimmune antibodies, serum proteins, immunoglobulin's (Ig's), specific proteins such as tumor markers. ADI has also expanded the ELISA kits to establish efficacy of various vaccines by developing vaccine-specific antigen and antibody ELISA. ADI is now offering "**Custom Testing of Samples**" for various analytes.



## ADI manufactures hundreds of specialized animal, human, and monkey ELISA kits

- ELISA kits for vaccine testing (Diphtheria, Pertussis, Tetanus, Rabies, Polio, Rubella, HIB, Malaria, Hepatitis, Influenza, Meningitis, Tuberculosis, Anthrax, Ebola, JEV, HPV etc)
- Animal and human autoimmune ELISA kits (anti-dsDNA, ANA, anti-SSA/B, Cardiolipin etc)
- Therapeutic humanized antibodies (Herceptin, Rituximab, Xolair and Humira etc)
- Animal health screening (MPV, MHV, MNV, EDIM, LCMV, KRV, Sendai etc)
- Host Cell Proteins (HCPs) ELISA (E. Coli, CHO, SP2/0; Protein A/G, BSA, Ovalbumin)
- Serum Protein Profile (Albumin, Transferrin, Lactoferrin, IgG, IgM, IgA, and IgE etc)
- Environmental Chemicals, Drugs, and Antibiotic Residues ELISA (Ampicllin, Sulofonamides, DES, Tylosin etc)
- Serum Proteins, Hormones, and Tumor Markers (Leptin, Adiponectin, Resistin, Insulin, CEA, PSA, AFP, CA125, CA199, EPO, BMPs, Defensins BD1-3, Peptide, Thyroid and steroid hormones)

## *Advantages of working with ADI as CRO?*

- ✓ *20+ years of industry experience*
- ✓ *ADI is the sole manufacturer of 100s of ELISA kits. Other CROs will purchase kits from ADI. It cost more and loss of time.*
- ✓ *We know more about the kit and how to optimize the sample testing and maximize the use of the kits. All testing done at one place using a single lot of the kits*
- ✓ *Most competitive pricing and efficient documentation of data*
- ✓ *Confidential GLP-level testing*
- ✓ *Contact ADI for details and customized quote.*



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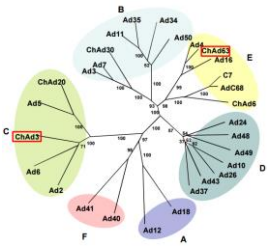
# Adenovirus Vaccines Antibody ELISA Kits, Recombinant Proteins, and Antibodies

**Adenoviruses** (members of the family Adenoviridae) are medium-sized (90–100 nm), nonenveloped viruses with an icosahedral nucleocapsid containing a dsDNA genome. Their name derives from their initial isolation from human adenoids in 1953. The adenovirus is a ubiquitous pathogen of humans and animals. Adenoviruses are also known to cause respiratory infections in horses, cattle, pigs, sheep, and goats. Adenoviruses have a broad range of vertebrate hosts; there are 57 accepted human adenovirus types (HAdV-1 to 57) in seven species (**Human adenovirus A to G;** Genus Mastadenovirus (including all human adenoviruses); type species: Human adenovirus C) have been found to cause a wide range of illnesses, from

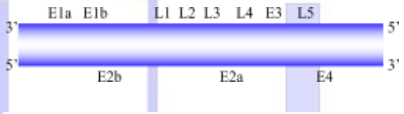



mild respiratory infections in young children to life-threatening multi-organ disease in people with a weakened immune system. Adenoviruses are endemic in all populations throughout the year. The infection is spread both through the aerial-droplet route and the routes characteristic for intestinal infections. Adenoviruses mainly infest respiratory and intestinal mucosa, but also the cornea. They are accumulated in the epithelial cells and regional lymph nodes. Adenoviruses cause the widest variety of illnesses of the known respiratory viruses. The adenovirus infection is the most frequently caused viral disease of the respiratory tract among preschool children (types 1 - 5 and 7). Pneumonia is the most severe form of adenoviral infection occurring mostly in infants below the age of one. Adenovirus infections cause approximately 15,000 illnesses per year in basic Army trainees. In the past, US military recruits were vaccinated against two serotypes of adenotypes, with a corresponding decrease in illnesses caused by those serotypes. The vaccine is no longer manufactured, and there are currently no vaccines available to protect against the adenovirus.

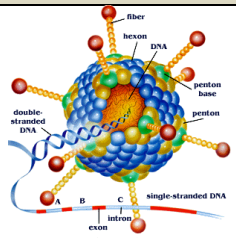
The new **adenovirus vaccine tablets** offers protection against two strains of the virus, type 4 and type 7, and is administered in tablet form **containing the live virus (32,000 TCID)**. The tablets are intended to be swallowed whole so they can pass through the stomach intact and then release the virus in the intestines. In clinical trials supported by both the Army and the Navy among other organizations, scientists found the new vaccine provided 99.3% protection against febrile respiratory illnesses due to the adenovirus type 4 while stimulating protective levels of antibodies against the adenovirus type 7.


Old discontinued Adenovirus vaccine (Wyeth)

New Adenovirus vaccine tablets (Barr Labs)



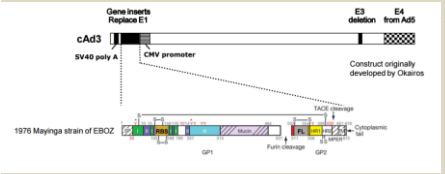

Adenovirus genome, showing Early genes (E) and Late genes (L).




Adenovirus

The serologic tests are particularly important because they document actual infection in the patient and can be applied to large-scale epidemiologic investigations. The CF and ELISA tests measure predominantly the antibodies directed against the group-specific determinants on the **hexon component**. The recommended tests for measuring type specific antibodies are hemagglutinin inhibition and serum neutralization. The type-specific antigenic determinants of adenoviruses are located at the fibers on the capsid. Because of the ubiquity of the adenoviruses and numerous cross-reactions between related serotypes, seroconversion involving a fourfold or greater rise in antibody infection is necessary to document infection. IgG is the predominant antibody class measured in the serologic tests.

## Adenovirus-Ebola Vaccine




Adenoviruses represent the largest nonenveloped viruses. They are able to be transported through the endosome (i.e., envelope fusion is not necessary). The virion also has a unique "spike" or fiber associated with each penton base of the capsid that aids in attachment to the host cell via the receptor on the surface of the host cell. Adenoviruses have long been a popular viral vector for **gene therapy** due to their ability to affect both replicating and non-replicating cells, accommodate large transgenes, and code for proteins without integrating into the host cell genome. Replication-deficient human adenovirus type 5 (Ad5) can be produced to high titers in complementing cell lines, such as PER.C6, and is widely used as a vaccine and gene therapy vector. However, preexisting immunity (neutralizing antibodies, NA) against Ad5 hampers consistency of gene transfer, immunological responses, and vector-mediated toxicities. Strategies to bypass NA to Ad5 viruses include switching of adenovirus type and use of animal adenoviruses. Of the 47 types tested, subgroup B viruses Ad35 and Ad11 proved rarely neutralized by human sera.

**Ebola Vaccine**: VRC 207 is a phase 1 clinical trial designed to determine the safety, side-effect profile, and immunogenicity of an investigational recombinant cAd3 ebolavirus vaccine (GP from the Zaire and Sudan strains as they are responsible for majority of Ebola cases). The vaccine was developed by Okairos (now owned by GSK), and demonstrated protection in NHP modelcAd3 was selected as a vector due to low prevalence of preexisting Ad3 antibodies.

ADI has developed adenovirus (Ad5) antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines.

## Adenovirus vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

| Items Description | Species | Antibody Type **IgG** Cat# | Antibody Type **IgM** Cat# | Antibody Type **IgA** Cat# |
|---|---|---|---|---|
| Human Adenovirus Vaccine Antibody ELISA kits (Whole virus antigen based) | Human | 950-110-AHG | 950-120-AHM | 950-100-AHA |
| | Mouse | 950-130-AMG | 950-140-AMM | |
| | Monkey | 950-150-AMG | 950-155-AMM | |



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## Adenovirus Vaccines Antibody ELISA Kits, Recombinant Proteins, and Antibodies

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Adenovirus Virus antibodies | ADV11-A | Goat Anti-Adenovirus type 2, hexon IgG (reacts with 1-7a, 8, 31, 40-41) | antibodies |
| | ADV11-FITC | Goat Anti-Adenovirus type 2, hexon IgG-FITC conjugate | antibodies |
| | ADV12-FITC | Monoclonal Anti-Adenovirus (many isotypes) IgG-FITC conjugate | antibodies |
| | ADV12-M | Monoclonal Anti-Adenovirus (many istoypes) hexon IgG | antibodies |
| | ADV13-M | Monoclonal Anti-Adenovirus type 40 IgG, aff pure | antibodies |
| | ADV14-M | Monoclonal Anti-Adenovirus type 41 IgG, aff pure | antibodies |
| | ADV15-M | Monoclonal Anti-Adenovirus type 40/41 IgG, aff pure | antibodies |
| | ADV16-M | Monoclonal Anti-Adenovirus hexon (types 1, 5, 8, 27) IgG | antibodies |
| | ADV17-M | Monoclonal Anti-Adenovirus type (pan, reacts with all human serotypes) IgG | antibodies |
| | ADV65-N | Adenovirus (strain Adenoid 6) type 2, (antigens, host MRC-5 cells) | Antigen |
| | ADV66-N | Adenovirus (strain Adenoid 6) type 2 hexons antigens, purified (host Vero cells) | Antigen |

Rev. 120929A



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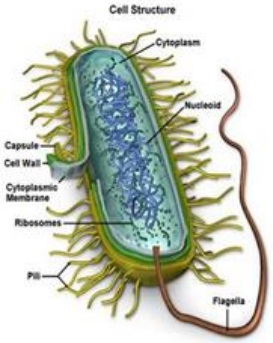
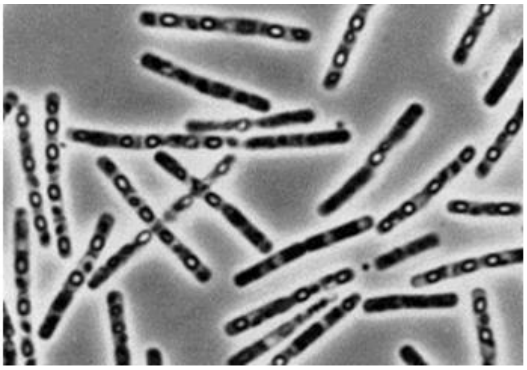
# Anthrax Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Anthrax is a zoonotic disease caused by the spore-forming bacterium Bacillus anthracis. The disease most commonly occurs in wild and domestic mammals (e.g., cattle, sheep, goats, camels, antelope, and other herbivores). Anthrax occurs in humans when they are exposed to infected animals or tissue from infected animals or when they are directly exposed to B. anthracis or the spores. Depending on the route of infection, anthrax disease can occur in three forms: cutaneous, gastrointestinal, and inhalation. B. anthracis spores can remain viable and infective in the soil for many years.




B. anthracis has also been manufactured as a biological warfare agent because of the ability of its spores to be transmitted by the respiratory route, the high mortality of inhalation anthrax, and the greater stability of B. anthracis spores compared with other potential biological warfare agents. B. anthracis evades the immune system by producing an anti phagocytic capsule. In addition, B. anthracis produces three proteins - protective antigen (PA), lethal factor (LF), and edema factor (EF) - that act in binary combinations to form two exotoxins known as lethal toxin and edema toxin. PA and LF form lethal toxin; PA and EF form edema toxin. LF is a protease that inhibits mitogen-activated protein kinase-kinase. PA is required for binding and translocating LF and EF into host cells. PA is an 83 kD protein that binds to receptors on mammalian cells and is critical to the ability of B. anthracis to cause disease. After binding to the cell membrane, PA is cleaved to a 63 kD fragment that subsequently binds with LF or EF. LF or EF bound to the 63KD fragment undergoes receptor-mediated internalization, translocation into the cytosol.

An improved vaccine for livestock, based on a live non encapsulated avirulent variant of B. anthracis, has served as the principal veterinary vaccine. AVA, Anthrax Vaccine Adsorbed (trade name **Biothrax**), the only licensed human anthrax vaccine in the United States, is produced by Emergent Biodefense Corporation (formerly BioPort) and is prepared from a cell-free filtrate of B. anthracis culture that contains no dead or live bacteria. The strain used to prepare the vaccine is a toxigenic, non-encapsulated strain known as V770-NP1-R. No living organisms are present in the vaccine. The filtrate contains a mix of cellular products including PA83 and is adsorbed to aluminum hydroxide as adjuvant. The amount of PA and other proteins per 0.5mL dose is unknown, and all three toxin components (LF, EF, and PA) are present in the product. Approximately 95% of vaccines seroconvert with a fourfold rise in anti-PA IgG titers after three doses. However, the precise correlation between antibody titer (or concentration) and protection against infection is not defined. While having some efficacy in protecting against anthrax, the dosage, safety and efficacy of this licensed vaccine is being debated by the Scientists as well as politicians. More advanced vaccines are based upon recombinant purified PA83 proteins (**Vaxgen**).

ADI has cloned, expressed, and purified various recombinant proteins of anthrax (PA, EF, LF) made antibodies in various animal, develop antigen determination kits, and antibody kits for testing various vaccines.

## Anthrax vaccine Related ELISA kits Ordering Information

| ELISA Kit Description | Species | Total Ig's Cat# | IgG Specific **Cat#** | IgM Specific **Cat#** |
|---|---|---|---|---|
| Anthrax Vaccine Protective Antigen 83 (**PA83**) antibody ELISA kits | Human | 900-160-83T | | |
| | Mouse | 900-100-83T | 900-105-83G | |
| | Monkey | 900-150-83T | | |
| | Goat | 900-130-83T | | |
| | Bovine | | 900-110-83G | |
| | G.pig | 900-140-83T | | |
| | Rabbit | 900-120-83T | | |
| | Swine/Pig | | 900-115-83G | |
| Anthrax Vaccine Anti-Edema Factor (**EF**) Antibody ELISA kits | Rabbit | 900-320-EFR | | |
| | Mouse | 900-300-EFM | | |
| Anthrax Vaccine Anthrax Lethal Factor (**LF**) antibody ELISA kits | Mouse | 900-200-LFM | | |
| Anthrax B. Anthracis Protective Antigen 83 (**PA83**) Protein ELISA kit, Quantitative # 800-110-P63 | | | | |
| Anthrax B. Anthracis Lethal Factor (**LF**) Protein ELISA Kit, Quantitative # 800-120-LF | | | | |
| Anthrax B. Anthracis Edema Factor (**EF**) Protein ELISA Kit, Quantitative #800-130-EF | | | | |



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# Anthrax Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2720

| Item | Catalog# | Product Description | ProductType |
|---|---|---|---|
| Anthrax Receptors (ATR) | ATR11-A | Rabbit Anti-human Anthrax Toxin Receptor 1, aff pure IgG # 1 | Antibodies |
| | ATR11-P | Human Anthrax toxin receptor protein Control/blocking peptide # 1 | Peptide |
| | ATR12-A | Rabbit Anti-human Anthrax Toxin Receptor 1, aff pure IgG # 2 | Antibodies |
| | ATR12-P | Human Anthrax toxin receptor 1 protein Control/blocking peptide # 2 | Peptide |
| | ATR31-A | Rabbit Anti-human Anthrax Toxin Receptor 3, aff pure IgG #1 | Antibodies |
| | ATR31-P | Human Anthrax toxin receptor 3 protein Control/blocking peptide # 1 | Peptide |
| Anthrax Cell wall | CWBA-1 | Cell wall, sermi pure (B. Anthracis) | Protein |
| Anthrax EF | EF11-A | Goat Anti-Edema factor (B Anthracis) IgG | Antibodies |
| | EF12-A | Rabbit Anti-B. Anthracis Edema factor (EF) (C-terminal peptide) IgG#2 | Antibodies |
| | EF12-C | Rabbit Purified Recombinant Anthrax toxin Edema Factor (EF) protein control for WB | Western control |
| | EF25-R | Purified Recombinant Anthrax toxin Edema Factor protein | Rec. Protein |
| Anthrax LF | LF11-M | Monoclonal Anti-Anthrax Lethal factor antigen IgG #1, aff pure | Antibodies |
| | LF12-MB | Monoclonal Anti-Anthrax Lethal factor (LF) protein IgG biotinylated | Antibodies |
| | LF13-A | Rabbit Anti-B. Anthracis Lethal factor (LF) (C-terminal peptide) IgG#3 | Antibodies |
| | LF13-C | Purified Recombinant Anthrax lethal factor (LF) protein control for WB | Western control |
| | LF14-A | Rabbit Anti-B. Anthracis Lethal factor (LF) recombinant protein antiserum | Antibodies |
| | LF15-R | Purified Recombinant Anthrax Lethal Factor protein | Rec. Protein |
| | LF16-A | Goat Anti-lethal factor (B Anthracis) IgG | Antibodies |
| | LFPI-4 | Lethal factor protease Inhibitor-1, Cell permeable, 14aa MEK2 analog, competitive inhibitor of LF | Peptide |
| | LFPS-1 | Lethal factor Protease Substrate 1, Internally quenched Coumarin peptide substrate for monitoring LF protease activity (19aa) | Peptide |
| | LFPS-2 | Lethal factor Protease Substrate 2, pNA derivative MEk2 peptide substrate for high-throughput screening of LF inhibitors (14aa) | Peptide |
| | LFPS-3 | Lethal factor Protease Substrate 3, AMC derivative MEk2 peptide substrate for high-throughput screening of LF inhibitors (14aa) | Peptide |
| Anthrax PA83 | PA83-R | Purified Recombinant Anthrax Protective Antigen (83 kD) | Rec. Protein |
| | PA11-M | Monoclonal Anti-Anthrax Protective antigen (PA83) IgG # 1, aff pure | Antibodies |
| | PA12-MB | Monoclonal Anti-Anthrax Protective antigen (PA83) IgG biotinylated | Antibodies |
| | PA16-A | Goat Anti-Protective Antigen 83 (PA83; B Anthracis) IgG | Antibodies |
| | PA16-B | Goat Anti-Protective Antigen 83 (PA83; B Anthracis) IgG-biotinylated | Antibodies |
| | PA17-A | Rabbit Anti-B. Anthracis Anthrax protective antigen 83 (PA83) (C-terminal peptide) IgG | Antibodies |
| | PA17-C | Purified Recombinant Anthrax Protective Antigen (PA83 kD) protein control for WB | Western control |
| | PA18-S | Rabbit Anti-B. Anthracis Anthrax protective antigen 83 (PA83) recomb. Protein antiserum | Antibodies |
| Anthrax PA20 | PA20-C | Purified Recombinant Anthrax Protective Antigen (20 kD/PA20) protein control for WB | Western control |
| | PA20-R | Purified Recombinant Anthrax Protective Antigen (20 Kda) | Rec. Protein |
| Anthrax PA63 | PA63-C | Purified Recombinant Anthrax Protective Antigen (63 kD/PA63) protein control for WB | Western control |
| | PA63-R | Purified Recombinant Anthrax Protective Antigen (63kD) | Rec. Protein |
| Anthrax Spore extract antigens | SA11-A | Rabbit Anti-Anthrax Spore extract antigen (90 kda), aff pure IgG #1 | Antibodies |
| | SA12-M | Monoclonal Anti-Anthrax Spore extract antigen IgG # 2, aff pure | Antibodies |
| | SA12-MB | Monoclonal Anti-Anthrax Spore extract antigen IgG-biotinylated, aff pure | Antibodies |
| | SA13-M | Monoclonal Anti-Anthrax Spore extract antigen IgG # 3, aff pure | Antibodies |



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## Bioprecess/Vaccine (HCP) Contaminats Detection and Removal ELISA Kits

Vaccines are among the greatest achievements of modern medicine. Vaccines are derived from either whole cells (bacteria or virus; live or attenuated) grown in chick embryo or in mammalian host cells. Subunit vaccines may be recombinant proteins expressed in E. coli or year or other host cells. Depending upon the source of the material, purified active vaccine components may still have remnants of the host (cellular proteins or host cell proteins or HCP, culture medium proteins (Fetal bovine serum or BSA, or Fetuin etc). These extraneous proteins or components are typically known host cell contaminants. FDA requires that the finished vaccine material be tested for the appropriate contaminant and their concentration kept to an acceptable level. Many additives or excipients (Proteins, bacteriostatic agents or adjuvants) are added to stabilize the vaccines or to enhance antigenicity (adjuvants). Elevated levels of the contaminants may be allergenic (ovalbumin) or carry risk of prophylaxis due to the production of antibodies to foreign proteins or risk of animal or human derived diseases.

| Excipient/Contaminants | Use | Vaccine (Brand) |
|---|---|---|
| **Albumin** Egg (Ovalbumin or OVA) | Rabies Virus Grown chick embryo fibroblast | Rabies (RabAvert) |
| **Albumin**, Human serum (HSA) | Growth medium, protein stabilizer | Measles (attenuvax), MMR (MMR-II), Mumps (Mumpsvax), Rabies (Imovax), Rubella (Meruvax) |
| **Albumin**, Bovine serum (BSA) | Growth medium, protein stabilizer | Hepatitis A (Harvix, Vaqta); Measles (Attenuvax), MMR (MMR-II), Mumps (Mumpsvax), Rabies (Imovax, Rabavert), Rubella (Meruvax), Vaccinia (Dryvax), Varicella (Varivax) |
| Egg Proteins or **Ovalbumin** | HCP contaminants | Influenza (all brands), Yellow Fever (YF-Vax) |
| **Gelatin** | Stabilizer in free-drying or solvent | DTaP (Tripedia), Influenza (Fluzone), JEV (JEVax), Measles (Attenuvax), Mumps (Mumpsvax), Rubella (Meruvax II), MMR (MMR-II), Rabies (RabAvert), Typhoid oral (Vivotif), Varicella (Varivax), Yellow fever (YF-vax) |
| **MRC-5 cells**/proteins | HCP contaminants | Hepatitis A (Hravix, vaqta), Hepatitis A-B (Twinrix), Rabies (Imovax), Poliovirus inactivated (Poliovax), Varicella (Varivax) |
| **Yeast proteins** | Growth medium | DTap-Heb B-IPV (Pediarix), Hepatitis A-B (Twinrix), Hepatitis B (Engerix-B, Recombivax HB), Hib (HibTiter), Hib-hepatitis (Comvax); medium for growing C. diphteriae strain C7 for CRM197 protein and for conjugation to polysaccharides (HibTiter, Prevnar) |
| **Bovine Proteins** | | DTaP-Hep B IPV (Poliovirus component, Pediatrix), Pneumococcal (Pneumovax-23), Typhoid oral (Vivotif) |
| **Bovine Calf Serum** or FCS | Cells grown in media containing FCS (BSA or Fetuin as HCP contaminants) | |
| **E. Coli** | E. coli HCPs contaminants for vaccine components expressed and/or purified from E. coli cells | |
| Chinese Hamster Ovary Cells (**CHO**) | CHO HCPs contaminants for vaccine components expressed and/or purified from CHO cells | |
| **Protein A/G** | Protein A/G used as affinity matrix to purify recombinant proteins (antigens) containing Fc-fusion protein partner or recombinant antibodies or monoclonal purified using Protein A/G affinity matrices | |
| **Plasmid DNA** | Hepatitis A (Vaqta) (Prototype for DNA-Vaccines) | |

ADI has developed simple, rapid, and highly sensitive ELISA kits to detect and measure various protein contaminants (BSA, HSA, Ovalbumin, Protein A, Protein G) and HCPs (E. Coli, CHO cells). ELISA kits are available to detect the antibodies to these contaminants in animals and humans. ADI has also developed reagents and methods to remove the bioprocess contaminants.

| Species | Product Description | Cat# |
|---|---|---|
| Chicken/Chick Embryo | **Ovalbumin** ELISA Kit for the measurement of Ovalbumin contamination in vaccines made in chick embryo | 6050 |
| | Chicken Egg **Ovalbumin** ELISA Kit (for high concn of ovalbumin such as eggs) | 6010 |
| | **Chicken IgG** ELISA for vaccine components grown in chick embryo | 6020 |
| Bovine Transgenic animals | Bovine Albumin (**BSA**) ELISA Kit (for high concn of BSA such as in fetal bovine serum or serum) | 8000 |
| | Bovine Albumin (**BSA**) ELISA Kit (for measuring residual BSA in vaccines) | 8100 |
| | Bovine **Lactoferrin** ELISA Kit for measuring residual protein in the milk of transgenic animals | 8090 |
| | Bovine **IgG** ELISA kit for measuring residual protein in vaccine grown in bovine serum or transgenic | 8010 |
| | Bovine **Transferrin** ELISA kit for measuring residual protein in vaccine grown in transgenic animals | 8070 |
| HSA | Human Serum Albumin (**HSA**) ELISA Kit for measuring HSA in vaccines | 1210 |
| Pig/Swine (Transgenic) | Pig **Albumin** ELISA kit for measuring albumin in recombinant protein derived from transgenic animals | 9000 |
| | Pig **IgG** ELISA kit for measuring IgG in recombinant protein derived from transgenic animals | 9020 |
| Goat/Sheep (Transgenic) | Goat **IgG** ELISA kit | 7520 |
| | Sheep **IgG** ELISA kit | 7620 |
| HCP | **E Coli** proteins (5 strains) host cell proteins (**HCPs**) ELISA kit | 800-130-ECP |
| | Chinese Hamster Ovary Cell (**CHO**) host cell Proteins (**HCPs**) ELISA kit | 800-140-CHO |
| | SP20 Mouse Myeloma Cells (**SP20**) Proteins host cell Proteins (**HCPs**) ELISA Ki | 800-150-SP2 |
| | **Protein-A** ELISA Kit, 96 tests, Quantitative | 800-110-PRA |
| | **Protein-G** ELISA Kit, 96 tests, Quantitative | 800-120-PRG |
| GST | Glutathione Transferase (**GST**-fusion protein) ELISA Kit | 800-400-GST |
| GFP | Green Fluorescent Protein (**GFP**-fusion protein) ELISA Kit | 800-420-GFP |
| His-tag | Histidine-tag (poly-His/Hisx6) Protein (**His-tag**-fusion protein) ELISA Kit | 800-440-HIS |



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## Bioprecess/Vaccine (HCP) Contaminats Detection and Removal ELISA Kits

ADI has also developed ELISA kits to monitor the presence of antibodies to various Bioprocess contaminants or additives to see if they actually invoke an antibody response when injected into animals or humans.

| Items Description | Species | Antibody Type Ig's Cat# | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|---|
| E. coli proteins/contaminants antibody ELISA | Mouse | 500-100-ECP | | |
| | Rabbit | 500-120-ECP | | |
| Bovine Serum Albumin (BSA) antibody ELISA | Goat | | 710-100-BSG | |
| | Rabbit | | 710-110-BSR | |
| | Chicken | | 710-120-BSC | |
| | Mouse | | 710-130-BSM | |
| | Human | | 710-140-BSM | |
| Glutathione Transferase (GST, Fusion protein) Antibody ELISA | Goat | | 720-100-GSG | |
| | Rabbit | | 720-110-GSR | |
| | Chicken | | 720-120-GSC | |
| Bovine Fetuin (calf serum contaminant) Antibody ELISA | Rabbit | 800-170-BFR | | |
| | Mouse | 800-180-BFM | | |

## Antibodies & Kits to remove small scale bioprocess contaminants

It is not only possible to detect and measure various bioprocess contaminants (purified proteins such as BSA, HSA, Protein A/G, Fetuin, Transferrin etc or complex components such as serum or chick embryo allantois fluid) but also used specific affinity matrices to remove them.

| Contaminant | Product Description | Cat# | Type |
|---|---|---|---|
| Albumin | Albumin-X, Albumin (multiple species) removal kit (sufficient to remove 2-3 mg albumin or process ~50-100 ul serum; 10 mini-columns ~250 ul resin) | 700-300-10 | Kit |
| | Albumin (Human, Mouse, rat, bovine and others) removal kit (**synthetic dye based** matrix; sufficient to remove 20-40 mg BSA from Bioprocessed material), 2 ml | 800-200-BSA | Kit |
| | Bovine serum albumin (BSA) removal kit (**Antibody based** aff matrix; sufficient to remove 1-2 mg BSA from Bioprocessed material), 2 ml aff column | 800-302-BSA | Kit |
| | Bovine Serum albumin-agarose (aff matrix) | BSA15-AS | Aff support |
| Fetuins | Monoclonal Anti-Human Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) IgG | FETA13-M | Antibodies |
| | Monoclonal Anti-Mouse Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) IgG | FETA14-M | Antibodies |
| | Purified human serum Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) protein | FETA25-N-1 | Pure protein |
| | Anti-Bovine Fetuin (Alpha-2 HS-Glycoprotein, AHSG, A2HS) antiserum | FETB11-S | Antibodies |
| | Anti-Human recombinant Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) IgG | FETB12-A | Antibodies |
| | Bovine Fetuin (Alpha-2 HS-Glycoprotein, AHSG, A2HS), BSE-TSE free (New Zealand Origin), Low endotoxin | FETB15-N-1 | Pure Protein |
| | Bovine Fetuin (Alpha-2 HS-Glycoprotein, AHSG, A2HS), BSE-TSE free (Australian Origin), Low endotoxin | FETB16-N-1 | Pure Protein |
| Chick Embryo/Allantoic Fluid | Chicken Allantoic Fluid host cell protein's ELISA kit, 2x 96 tests, Quantitative | 810-100-CAF | Kit |
| | Chicken Allantoic fluid (SPF eggs) tested –ve for various chicken viruses, Salmonella and Mycoplasma (suitable for chicken virus ELISA kits) | CAF11-S | control |
| | Chicken serum (SPF) tested –ve for various chicken viruses, Salmonella and Mycoplasma (suitable for chicken virus ELISA kits) | CSNC11-S | control |
| | Rabbit Anti-chicken egg ovalbumin IgG-agarose (aff matrix) | OVA11-AS | Aff support |
| | Rabbit Anti-chicken Egg Ovalbumin IgG | OVA11-S | Antiserum |
| | Monoclonal Anti-chicken Egg Ovalbumin ascites (IgG1) | OVA13-M | Antibodies |
| | Ovalbumin-agarose (aff matrix) to remove anti-ovalbumin Ig's from samples | OVA15-AS | Aff support |
| | Chicken egg ovalbumin protein (ELISA, antigen, allergy grade) | OVA15-N-1000 | Rec. Protein |
| FBS | Rabbit Anti-Fetal Bovine Serum (FBS) protein IgG | FBS11-A | Antibodies |
| | Rabbit Anti-FBS protein IgG-Agarose affinity matric to remove fetal bovine serum | FBS12-AS | Aff Support |



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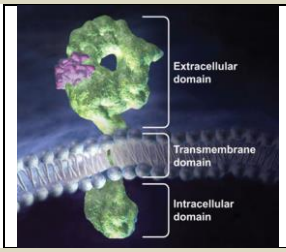
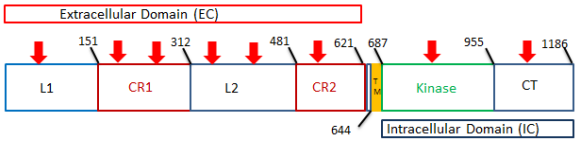
## Breast Cancer Vaccines: Antibody Recombinant Proteins, and Peptides

Breast cancer is a type of cancer originating from breast tissue of humans and other mammals. Worldwide, breast cancer comprises 23% of all cancers in women. In 2008, breast cancer caused 458,503 deaths worldwide (13.7% of cancer deaths in women). Breast cancer is more than 100 times more common in women than in men. Prognosis and survival rates for breast cancer vary greatly depending on the cancer type, stage, treatment, and geographical location of the patient. Self-examination, mammography and clinical breast exam can indicate an approximate likelihood that a lump is cancer. Breast cancers are classified by several grading systems (histopathology, Grade, Stage, Receptor status such as ER/PR/Her2 positive). Each of these influences the prognosis and can affect treatment response. Breast cancer is usually treated with surgery and then possibly with chemotherapy or radiation, or both. A multidisciplinary approach is preferable. For the purpose of "**Breast Cancer Vaccine**", we will review "**Her2 positive**" cancers that comprise about 30% of breast cancer.




**Her2 Protein Topology**

Topology of Her2 protein: EC=exracellular domain 23-652 aa (Herceptin mab binds to domain IV/CR2 within the EC region).

Many peptides of 10-30 aa in the EC domain, depcited by Red arrows, are also part of the peptides vaccine as single or multiple peptides (E75, GP2, AE37 & NeuVax). IC=intracelluyalr domain (676-1255 aa) is also a target of some vaccines. TM=transmembrance domain. Vaccines are also formulated with a variety of adjuvant to enhance the efficacy of the vaccine.

HER2 (Human Epidermal Growth Factor Receptor 2) also known as Neu, ErbB-2, CD340 (cluster of differentiation 340) or p185 is a protein that in humans is encoded by the ERBB2 gene. HER2 is a member EGFR/ErbB family. The HER proteins, including Her2, regulate cell growth, survival, adhesion, migration, and differentiation—functions that are amplified or weakened in cancer cells. Since breast cancer cell overexpress and need Her2 protein for their proliferation, a direct or indirect neutralization of Her2 should impair the ability of breast cancer to spread and grow. **Herceptin** (trastuzumab made by Genentech and approved in 1998) is a humanized monoclonal antibody that binds to Her2 protein and interferes with its functions. Herceptin is made by recombinant DNA technology in then injected into patient. It increases the survival of people with cancer by 20-25 months in late stages. However, cancers usually develop resistance to trastuzumab. Approx. 70% of HER2+ patients do not respond to treatment. In fact resistance is developed rapidly by treatment, in virtually all patients. The antibody treatment is also expensive ($100,000 per year). Another monoclonal antibody, **Pertuzumab**, which inhibits dimerization of HER2 and HER3 receptors, was approved by the FDA in 2012.

**Breast cancer vaccines** mimic the success of Herceptin by immunizing with either large recombinant Her2 protein fragments or various antigenic peptides (single or mixture). The objecitve is to induce the production of antibodies in the patients. This will reduce the cost of producing and injecting Herceptin and also reduce Her2 resistance. **NeuVax,** developed by Galena Biopharma, is a peptide-based vaccine aimed at preventing or delaying the recurrence of breast cancer in cancer survivors who achieve remission after standard of care treatment (e.g., surgery, radiation, chemotherapy). It consists of the **E75 synthetic peptide (Her2 369-377)** initially isolated from HER2/neu proto-oncogene combined with the immune adjuvant, granulocyte macrophage colony stimulating factor (rhGM-CSF from yeast).

**GP2 peptide** (654-662) is a 9 aa HLA-A2-restricted peptide derived from the transmembrane domain of HER2. It is as effective as E75 at inducing a CTL response, suggesting that it might be more immunogenic than E75. A phase I clinical study using GP2 in combination with GM-CSF is ongoing. **AE37 peptide** (776-790 aa) is a HER2/Neu-derived epitope linked to Ii-Key peptide (Ii-Key/HER2/neu hybrid peptide or AE37). A Phase I clinical trial administering AE37, a HER2/neu Class II epitopes to disease-free, NN breast cancer patients showed that the Ii-Key moiety, a 4-amino acid (LRMK) epitope from the MHC class II-associated invariant chain (Ii protein), increases T-helper cell stimulation. **QIAKGMSYL** is a peptide, derived from the ECD of Her2. It is naturally presented by various HER2 positive cell lines.

**Multi peptide vaccines**: These peptides are derived from the ICD and ECD of Her2. ECD-derived peptides (p42 (aa 42–56), p98 (aa 98–114) and p328 (aa 328–345); ICD-derived peptides (p776 (aa 776–790), p927 (aa 927–941) and p1166 (aa 1166–1180); Derived from both domains: p369 (aa 369–386), p688 (aa 688–703) and p971 (aa971–984). Peptides derived from the **HER-2/trastuzumab interface** Peptides derived from the HER-2/trastuzumab interface (**563CYC**:is a cyclic peptide containing the sequences 563- 598); **585CYC** is a cyclic peptide containing sequences 585-598. **597CYC** is a cyclic peptide containing sequences 597-626. The last a.a cys is mutated to Leu so as to prevent interference with natural disulphide formation. **613** is a peptide containing sequences 613-626.

**Her2 Protein Vaccines**: HER2 ICD (aa 676– 1255): phase I clinical trial showed T cell response specific for HER2 ICD in 89% of immunized patients and 82% developed anti-HER2 IgGs. **dHER2** Is a recombinant anti-HER2 protein-based vaccine, made of the HER2 ECD and a portion of ICD this vaccine was evaluated in 15 patients with breast cancer and showed that Abs specific for HER2 ECD and ICD developed after 4 immunizations. **CHP-HER2** (aa1–146) is a recombinant vaccine composed of a truncated HER2 protein encoding aa terminal) complexed to a delivery system consisting of Cholesteryl Pullulan nanogels (CHP). **MVF-HER-2 vaccine**: Phase 1: HER2/neu peptide vaccine comprising measles virus epitope MVF-HER-2 (266-296) and MVF-HER-2 (597-626) emulsified with nor-MDP in ISA 720.

**Her2 DNA Vaccines**: DNA vaccines encode a modified human HER2 protein without tyrosine kinase activity. All of them induced both cellular and humoral immune responses leading to in vivo tumor protection. **pE2A** which encodes a full length HER2 in which Lys753 has been substituted by Ala to remove the ATP-binding Lys residue; **pE2TM** encodes the HER2 signal peptide, extracellular and transmembrane domains but not the intracellular ; **psecE2** encodes the 1–505) of ECD as a secreted protein. **pcytE2** (i.e., HER2 without signal peptide) elicited only a CD8+ TL response; **p185**, encodes HER2 ECD and the TM domain, was effective in inhibiting carcinogenesis in a transgenic mouse model; **MVA-BN-HER2** formed by a non-replicating viral vector encoding a truncated form of HER2 protein (without its ICD) and two universal T epitopes of the tetanus toxin used to boost the immune system.

All of the above vaccines (her2 peptides, protein or DNA) must be able to induce robust antibodies to Her2 protein. It will also be important to identify subtype of her2-antibody as a result of vaccine. ADI has developed antibody ELISA kits for animals and humans to determine the efficacy of various existing Her2 vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. ELISA kits are also available to measure the her2 in animals and humans and if patients are producing antibodies to Her2 in response to Herceptin immunotherapy. We have also developed ELISA kits to detect if cancer patients or animals already have autoantibodies to her2 as a results tumor overexpressing her2.



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## Breast Cancer Vaccines: Antibody Recombinant Proteins, and Peptides

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2764

| Items Description | Species | Cat# | |
|---|---|---|---|
| **Herceptin**/Trasuzumab ELISA Kit for serum or biological buffers | Human/Mouse /Rat | 200-510-HLG | |
| Human **Anti-Herceptin**/Trasuzumab Antibody (HAHA) ELISA Kit | Human | 200-520-HAG | |
| **Her2**/neu/Erbb2/CD340 protein ELISA kit, 96 tests | Human | 200-530-HER | |

| Items Description | Species | IgG Specific Cat# | IgM Specific Cat# |
|---|---|---|---|
| Her2 Vaccine (Anti-**Her2 Protein**, EC-Domain) ELISA Kit | Human | 200-600-HRH | 200-610-HRM |
| | Mouse | 200-620-HRH | 200-630-HRM |
| Her2 Vaccine (Anti-**E75 peptide**) IgG ELISA kit | Human | 200-640-HRH | 200-650-HRM |
| | Mouse | 200-660-HRH | 200-670-HRM |
| Her2 Vaccine (Anti-**AE37 peptide**) IgG ELISA kit | Human | 200-700-HRH | 200-710-HRM |
| | Mouse | 200-720-HRH | 200-730-HRM |

## Breast Cancer Vaccines: Antibody Recombinant Proteins, and Peptides

| Catalog# | Product Description | Product Type |
|---|---|---|
| HER21-R-10 | Recombinant (HEK) human Her2/Erbb2/Neu (1-652)-hIgG-Fc fusion protein | Protein |
| HER22-R-5 | Recombinant (sf9) human Her2/Erbb2/Neu (676-1255)-GST fusion protein | Protein |
| HER23-R-10 | Recombinant (HEK) human Her2/Erbb2/Neu (1-652)-his tag | Protein |
| HER24-R-10 | Recombinant (HEK) mouse Her2/Erbb2/Neu (1-653)-his tag protein | Protein |
| HER25-R-10 | Recombinant (HEK) mouse Her2/Erbb2/Neu (1-653)-hIgG1-Fc fusion | Protein |
| HER26-R-10 | Recombinant (HEK) rat Her2/Erbb2/Neu (4-656)-his tag fusion protein | Protein |
| HER27-R-10 | Recombinant (HEK) rat Her2/Erbb2/Neu (4-656)-his tag fusion protein | Protein |
| HER28-R-10 | Recombinant (HEK) rat Her2/Erbb2/Neu (4-656)-hIgG1-Fc fusion protein | Protein |
| HER29-R-10 | Recombinant (HEK) monkey/rhesus Her2/Erbb2/Neu (1-652)-his tag protein | Protein |
| HER30-R-10 | Recombinant (HEK) monkey/rhesus Her2/Erbb2/Neu (1-652)-hIgG1-Fc | Protein |
| HER31-M | Rabbit mono anti-human Her2/Erbb2/Neu (1-652) protein IgG | Antibodies |
| HER32-A | Rabbit Anti-human Her2/Erbb2/Neu (1-652) protein IgG | Antibodies |
| HER33-M | Mouse mono anti-monkey/rhesus Her2/Erbb2/Neu (1-652) protein IgG | Antibodies |
| HER34-A | Rabbit Anti-monkey/rhesus Her2/Erbb2/Neu (1-652) protein IgG | Antibodies |
| HER2-369-P | HER2 peptide, (369 – 377), E 75 vaccine | peptides |
| HER2-563-P | HER2 peptide, cyclic, (563-598, cys- cys disulphide bond); vaccine candidate | peptides |
| HER2-585-P | HER2 peptide, cyclic, (585-598, cys- cys disulphide bond); vaccine candidate | peptides |
| HER2-597-P | HER2 peptide, cyclic, (597-626, cys- cys disulphide bond) vaccine candidate | peptides |
| HER25-R-10 | HER2/ErB2 recombinant protein (1-652, extracellular domain), Recombinant | peptides |
| HER2-613-P | HER2 peptide, cyclic, (613-626, cys- cys disulphide bond); vaccine candidate | peptides |
| HER2-654-P | HER2 peptide, (654 – 662), GP2 vaccine | peptides |
| HER26-R-10 | HER2/ErB2 recombinant protein (676–1255, intracellular domain), Recombinant | Protein |

| Catalog# | Product Description | Product Type |
|---|---|---|
| HER2-776-P | HER2 peptide, (776 – 790 fused with LRMK, C-Term ), GP2 vaccine candidate | Peptides |
| HER2-MP1 | HER2 multi peptide, (369-386, 688-703,971-984); vaccine candidate | Peptides |
| HER2-MP2 | HER2 multi peptide, (776-790,927-941,116-1180); vaccine candidate | Peptides |
| HER2-MP3 | HER2 multi peptide, (42-56,98-114,328-345); vaccine candidate | Peptides |
| SM-101000-5 | EGFR/HER2 kinase inhibitor (>99%, M.wt 485.94) (Afatinib/BIBW-2992 | Chemical |
| SM-101010-5 | Inhibitor of EGFR/HER family (Her1, Her2, Her3 or Pan Her-inhibitor) (BMS-59926/AC480, Mol wt 567.01, >99%) | Chemical |
| SM-101020-10 | Inhibitor of EGFR/HDAC/Her2 (CUDC-101 Mol wt 434.49, >99%) | Chemical |
| SM-101040-5 | Cell permeable Inhibitor of EGFR/ERB family/Her2 (Neratinib/HKI-272, | Chemical |
| SM-101050-100 | Cell permeable Inhibitor of EGFR2/FGFR/PDGFr/JAK1/Her2 | Chemical |
| SP-102029-5 | Herpes Virus Inhibitor 1 (AA: Tyr-Ala-Gly-Ala-Val-Val-Asn-Asp-Leu) | Pure Peptide |
| SP-51177-1 | HER2/neu (869-877) peptide | Pure Peptide |
| SP-52260-1 | HER2/neu(654-662) GP2 | Pure Peptide |
| SM-101060-25 | Lapatinib Ditosylate (GW572016, GW2016, Tykerb, Tyverb), Autophos. Inhibitor of Her2/Erb2 ( >98%) | Chemical |
| SM-101070-10 | Canertinib (CI-1033), kinase Inhibitor of Her2/Erb2/EGFR (mol wt 485; >98%) | Chemical |
| SM-101080-5 | CP-724,714, Potent and selective Inhibitor of Her2/Erb2 (mol wt 469; >98%) | Chemical |
| SM-101090-5 | AZD8931, reversible and competitive Inhibitor of Her2/Erbb2/ErbB3 | Chemical |
| SM-101100-5 | AEE788 (NVP-AEE788), dual Inhibitor of Her2/Erbb2/EGFR (mol wt 440; >98%) | Chemical |
| SM-101110-10 | Mubritinib (TAK-165), potent Inhibitor of Her2/Erbb2 (IC50=6 nm | Chemical |
| SM-101120-5 | Arry-380, Oral, potent Inhibitor of Her2/Erbb2 Tyr kinase (IC50=8 nM; mol wt 869; >98%) | Chemical |
| SM-101130-5 | Tak-285, dual Inhibitor of Her2/EGFR Tyr kinase (IC50=17 nM; >98%) | Chemical |
| SM-101140-25 | Lapatinib, Inhibitor of Her2/EGFR (IC50=10 nM; mol wt 581; >98%) | Chemical |



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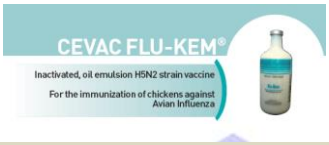
# Chicken Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

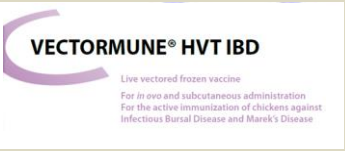
Poultry industry is a major industry generating billions of dollars worldwide. Poultry farming is the raising of domesticated birds such as chickens, turkeys, ducks, and geese, for the purpose of farming meat or eggs for food. Therefore, it is very important that the animals are raised in a clean and hygienic environment. Like humans or other animals, chickens suffer from various bacterial and viral diseases requiring treatment with antibiotics and vaccines. There are four main types of disease affecting poultry: metabolic and nutritional diseases; infectious diseases; parasitic diseases; and behavioral diseases. Infectious diseases are often contagious, which means they can be spread directly or indirectly from one living thing to another. These include **Avian Encephalomyelitis, Avian Influenza (AIV), Avian Tuberculosis, Chicken Anaemia Virus Infection (or CAV), Chlamydiosis, Egg Drop Syndrome (or EDS), Fowl Cholera (or Pasteurellosis), Fowl Pox, Infectious Bronchitis, Infectious Bursal Disease (or Gumboro), Infectious Coryza, Infectious Laryngotracheitis, Lymphoid Leukosis, Marek's Disease (MDV), Mycoplasmosis, Necrotic Enteritis, Newcastle Disease (NDV), Salmonellosis**. **Vaccination** plays an important part in the health management of the poultry flock. Some of the most common vaccines are infection with **E. coli** (O157:H7" strain) and Salmonella.




**Avian influenza (AI)** is a highly contagious viral infection which may cause up to 100% mortality in domestic chickens or turkeys. The disease is caused by a virus belonging to the family Orthomyxoviridae. Influenza viruses have two surface proteins, **haemagglutinin** (HA) and **neuraminidase** (N), that determine their subtype and the animal species they infect. When AI viruses of two haemagglutinin types, H5 and H7, infect domestic poultry (chickens or turkeys) they often mutate and virulent disease arises in these birds which is called highly pathogenic avian influenza (HPAI). The initial infection that does not cause or causes minimal disease is called low pathogenic avian influenza (LPAI). **OPTIMUNE® AIV vaccine** and **CEVAC FLU-KEM** contains the low pathogenic Avian Influenza virus Type A, Subtype H5N2, that is chemically inactivated and suspended in an oil emulsion.


**Chicken anaemia virus (CAV)** infection is an acute viral infection of chickens that is found worldwide. CAV can infect chickens of all ages but disease is only seen in young chickens and is characterized by depression, anorexia, anaemia, haemorrhage and a sudden rise in mortality. CAV is a small DNA virus. Vaccination of antibody-negative breeder flocks prior to the start of egg production is recommended. **Nobilis CAV P4** is a live attenuated vaccine against Chicken. **Anaemia Virus. CIRCOMUNE® W** is a live chicken Infectious Anemia Virus vaccine, Del Ros strain, for administration in the drinking water.


**Infectious bronchitis** (**IBV**) is a highly contagious viral respiratory infection of chickens; however the virus will also infect the urogenital and gastrointestinal tracts. Infectious bronchitis is caused by a coronavirus. Numerous vaccines are available commercially. The vaccine used should contain specific virus known to be present in the area. All vaccines contain live virus and those that give the best protection unfortunately can also produce symptoms of the disease. **MAXIMUNE® 8** and **CEVAC® ND IB IBD EDS K** contains in inactivated form of the virus in oil adjuvant.




**Marek's disease virus (MDV)** is a highly contagious viral infection that predominantly affects chickens. The disease is one of the most common diseases affecting poultry flocks worldwide. Mortality rates can be very high in susceptible birds. MD is caused by a highly cell-associated (virus particles that remain attached to or within the host cell after replication) but readily transmitted herpesvirus. There are three serotypes of MD virus. Virulent (disease causing) chicken isolates fall into serotype 1. Avirulent (not disease causing) chicken isolates fall into serotype 2. Serotype 3 designates the related avirulent virus that is commonly found in turkeys. **VECTORMUNE® HVT IBD & SB1** is live Marek Disease vaccines containing a genetically engineered Marek Disease virus of serotype 3 (turkey Herpesvirus or HVT) expressing key protective Infectious Bursal Disease antigens and a serotype 2 (SB-1) Marek Disease virus.

**Newcastle virus disease (NDV)** is a highly contagious viral infection that affects many species of domestic and wild birds. The disease can result in digestive, respiratory and/or nervous signs. Newcastle disease is caused by a paramyxovirus that can vary in pathogenicity from mild to highly pathogenic. Live Newcastle virus (**NDV**) **vaccine and CEVAC® NEW K** contain B1 Type, LaSota Strain virus in inactivated form with an oil adjuvant.

ADI has developed antibody ELISA kits for chicken viruses to determine the efficacy of existing vaccines and test new vaccines. **The antibody titer can be determined in serum or directly in egg yolks** using special antibody diluents that stabilizes and extracts the antibodies from egg yolks.

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| Avian Influenza A virus (**AIV**) vaccine Antibody ELISA | Chicken | 920-100-AIV | 920-105-AIM |
| Chicken Anemia Virus (**AV**) vaccine antibody ELISA | Chicken | 920-110-AV | |
| Chicken Infectious Bronchitis Virus (**IBV**) vaccine antibody ELISA | Chicken | 920-120-IBV | |
| Avian Marek's disease virus (**MDV**) vaccine antibody ELISA | Chicken | 920-130-MDV | |
| Chicken Newcastle Disease Virus (**NDV**) vaccine antibody ELISA | Chicken | 920-140-NDV | |
| Chicken Avian Influenza virus (**H5N1**) vaccine antibody ELISA | Chicken | 920-300-H51 | |



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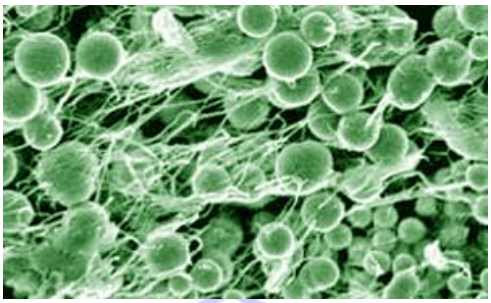
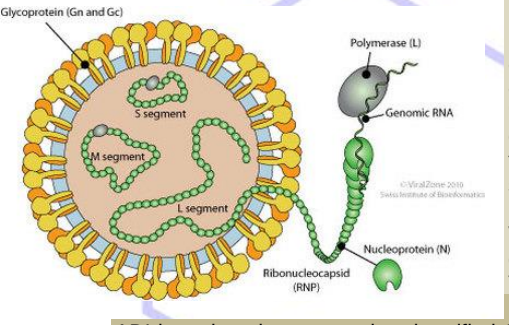
## Crimean-Congo Hemorrhagic Fever Virus (CCHFV) Vaccines ELISA Kits, Proteins and Antibodies

Crimean–Congo hemorrhagic fever (CCHF) is a widespread tick-borne viral disease, a zoonosis of domestic animals and wild animals, that may affect humans. The pathogenic virus, especially common in East and West Africa, is a member of the Bunyaviridae family of RNA viruses. Clinical disease is rare in infected mammals, but commonly severe in infected humans, with a 30% mortality rate. Outbreaks of illness are usually attributable to handling infected animals or people. Crimean-Congo hemorrhagic fever is found in Eastern Europe, particularly in the former Soviet Union. It is also distributed throughout the Mediterranean, in northwestern China, central Asia, southern Europe, Africa, the Middle East, and the Indian subcontinent.



The virus is a member of the genus Nairovirus, family Bunyaviridae. The genome is circular, ambisense RNA in three parts - Small (S), Middle (M) and Large (L). The L segment encodes the RNA polymerase; the M segment encodes the envelope proteins (Gc and Gn); and the S segment encodes the nucleocapsid protein. The envelope protein is initially translated as a glycoprotein precursor which is then cleaved into two smaller proteins. Based on the sequence data seven genotypes have been recognised: Africa 1 (Senegal), Africa 2 (Democratic Republic of the Congo and South Africa), Africa 3 (southern and western Africa), Europe 1 (Albania, Bulgaria, Kosovo, Russia and Turkey), Europe 2 (Greece), Asia 1 (the Middle East, Iran and Pakistan) and Asia 2 (China, Kazakhstan, Tajikistan and Uzbekistan).




Typically, after a 1–3 day incubation period following a tick bite (5–6 days after exposure to infected blood or tissues), flu-like symptoms appear, which may resolve after one week. In up to 75% of cases, however, signs of hemorrhage appear within 3–5 days of the onset of illness in case of bad containment of the first symptoms: first mood instability, agitation, mental confusion and throat petechiae, then soon nosebleeds, bloody urine and vomiting, and black stools. The liver becomes swollen and painful. Disseminated intravascular coagulation may occur as well as acute kidney failure and shock, and sometimes acute respiratory distress syndrome. Patients usually begin to show signs of recovery after 9–10 days from when the symptoms appear, however 30% of the cases result in death on the second week of the illness. Treatment is primarily symptomatic and supportive, as there is no established specific treatment. Ribavirin is effective in vitro and has been used during outbreaks, but there is no trial evidence to support its use.

**Vaccines**: A Turkish research team led by Refik Saydam Health Institute has developed treatment-serum derived from blood of several CCHF-patients, which have been proven to be %90 effective in CCHF-patients. The vaccine is pending for approval by FDA.

ADI has cloned, expressed and purified CCHFV nucleoprotein (482-aa, ~55 Kda) that is being used as a candidate for newer subunit vaccine for Congo virus. ADI's Congo virus nucleoprotein antibody ELISA kit can be used to determine the level of antibodies during natural infection or in vaccinated individuals.

### CCHFV vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2763

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| Congo Virus Vaccine Crimean-Congo hemorrhagic fever virus (CCHFV) nucleoprotein antibody ELISA Kit | Mouse | AE-320400-1 | AE-320410-1 |
| | Human | AE-320420-1 | AE-320430-1 |
| | Rabbit | AE-320440-1 | |

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Crimean-Congo hemorrhagic fever virus proteins and antibodies | CCHFV11-C | Recombinant (E.coli) Crimean-Congo hemorrhagic fever virus nucleoprotein protein (CCHFV, full length, his-tag, 55 kda) control for WB | Western control |
| | CCHFV11-S | Rabbit Anti-Crimean-Congo hemorrhagic fever virus nucleoprotein protein (CCHFV-NP, full length) antiserum | Antiserum |
| | CCHFV15-R-10 | Recombinant (E.coli) Crimean-Congo hemorrhagic fever virus nucleoprotein protein (full length, his-tag, 55 kda), purified | Antigen protein |

Congo_Virus_Vaccine_Flr . 130207A

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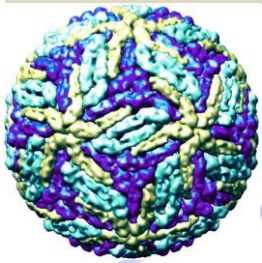
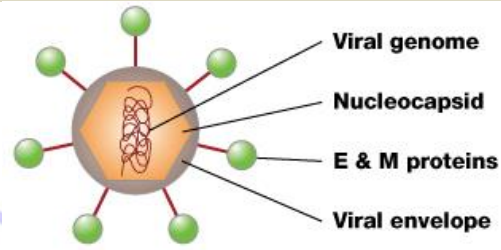
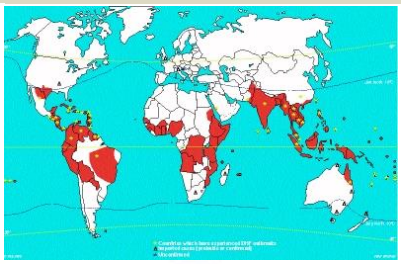
## Dengue virus Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Dengue fever, also known as break bone fever, is an infectious tropical disease caused by the dengue virus. The term dengue fever came into general use only after 1828. The word dengue is Spanish for "affectation," "careful," or "fastidious." The term probably described the cautious, stiff movements of patients suffering from the muscle, bone, and joint pain caused by dengue fever. Some researchers believe that the name came from a Swahili phrase Ka dinga pepo, or a disease caused by an evil spirit. Dengue symptoms include fever, headache, muscle and joint pains, and a characteristic skin rash that is similar to measles. In a small proportion of cases the disease develops into the life-threatening dengue hemorrhagic fever (DHF), resulting in bleeding, low levels of blood platelets and blood plasma leakage, or into dengue shock syndrome, where dangerously low blood pressure occurs. Dengue is transmitted by several species of mosquito within the genus Aedes, principally A. aegypti. The virus has four different but related types 1-4 (Den1-4); infection with one type usually gives lifelong immunity to that type, but only short-term immunity to the others. Subsequent infection with a different type increases the risk of severe complications. There are up to 100 million cases of dengue fever worldwide every year; the most common occurrences are in urban parts of subtropical and tropical areas, such as Central and South America, parts of Africa, parts of Asia, the Caribbean and the Pacific.





Dengue fever virus (DENV) is an RNA virus of the family Flaviviridae; genus Flavivirus. Other members of the same genus include yellow fever virus, West Nile virus, St. Louis encephalitis virus, Japanese encephalitis virus, tick-borne encephalitis virus, Kyasanur forest disease virus, and Omsk hemorrhagic fever virus. Most are transmitted by arthropods (mosquitoes or ticks), and are therefore also referred to as arboviruses (arthropod-borne viruses). The dengue virus genome code for the three different types of protein molecules (**C, prM and E**) that form the virus particle and seven other types of protein molecules (NS1, NS2a, NS2b, NS3, NS4a, NS4b, NS5) that are only found in infected host cells and are required for replication of the virus. The diagnosis of dengue is typically made clinically, on the basis of reported symptoms and physical examination; this applies especially in endemic areas. Additional lab tests include cell culture, PCR, and antibody detection by ELISA. As there is **no approved Dengue vaccine**, prevention is sought by reducing the habitat and the number of mosquitoes and limiting exposure to bites. A number of vaccines are undergoing testing. The most developed is based on a weakened combination of the yellow fever virus and each of the four dengue serotypes.

ADI has developed antibody ELISA kits to determine the efficacy of Dengue vaccines. Recombinant proteins and antibodies to DEN1-4 are also available to facilitate research on Dengue vaccine.

### Dengues Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| **Dengue Virus Vaccine** Antibody ELISA kits (detect antibodies to whole viral inactivated proteins) | Human | 540-100-DHG | 540-110-DHM |
| | Mouse | 540-120-DHG | 540-130-DHM |

| Type | Catalog# | Product Description | Product Type |
|---|---|---|---|
| DEN-1 | RP-1594 | Recombinant (E. coli) Dengue Virus Type 1 E Antigen (DENV E), antigen grade (>95% pure) | Pure protein |
| | RP-1601 | Recombinant (E. coli, his-tag) Dengue Virus NS1, Type 1 protein, full length | Pure protein |
| | RP-1605 | Recombinant (E. coli) Dengue Virus Type 1 envelop protein (D-III), pure (>95%) | Pure protein |
| | RP-1608 | Recombinant (E. coli) Dengue Virus Type 1 N-terminus envelop immunodominant regions, pure | Pure protein |
| | RP-344 | Recombinant Dengue Virus NS3 Type 1 protein | Pure protein |
| DEN-2 | AB-14310 | Mouse Anti-Dengue Type 2 (envelop) IgG, aff pure | Antibodies |
| | AB-22122 | Monoclonal Anti-Dengue Virus Type 2, NS1 glycoprotein, culture medium | Antibodies |
| | RP-1595 | Recombinant (E. coli) Dengue Virus Type 2 E Antigen (DENV E), antigen grade (>95% pure) | Pure protein |
| | RP-1607 | Recombinant (E. coli, his-tag) Dengue Virus NS1 Type 2 immunodominant protein | Pure protein |
| | RP-1620 | Recombinant (E. coli, his-tag) Dengue Virus NS1, Type 2 protein | Pure protein |
| | RP-345 | Recombinant Dengue Virus NS1 c-end Type 2 protein | Pure protein |
| | RP-346 | Recombinant (E. coli, GST-tag) Dengue Virus NS1 n-end Type 2 protein | Pure protein |
| | RP-1598 | Recombinant (E. coli) Dengue Virus Type 2 (and type 1, 2, and 3) E Antigen (DENV E) | Pure protein |
| DEN-3 | RP-1596 | Recombinant (E. coli) Dengue Virus Type 3 E Antigen (DENV E), antigen grade (>95% pure) | Pure protein |
| | RP-1600 | Recombinant (E. coli, his-tag) Dengue Virus NS1, Type 3 protein, full length | Pure protein |
| | RP-1603 | Recombinant (E. coli) Dengue Virus Type 3 envelop protein (D-III), pure (>95%) | Pure protein |
| DEN-4 | RP-1597 | Recombinant (E. coli) Dengue Virus Type 4 E Antigen (DENV E), antigen grade (>95% pure) | Pure protein |
| | RP-1599 | Recombinant (E. coli, his-tag) Dengue Virus NS1, Type 4 protein, full length | Pure protein |
| | RP-1604 | Recombinant (E. coli) Dengue Virus Type 4 envelop protein (D-III), pure (>95%) | Pure protein |
| DEN1-4 | AB-21120 | Rabbit Anti-Dengue Type 1-4 viruses antiserum | Antibodies |
| | AB-21121 | Monoclonal Anti-Dengue Virus Type 1-4 (pan, E antigen) IgG | Pure protein |
| | RP-1602 | Recombinant (E. coli) Dengue Virus Type 1+4, 2, and 3 envelop proteins antigen grade pure | Pure protein |
| | RP-1606 | Recombinant (E. coli) Dengue Virus Type 1-4 envelop+NS domains, pure (>95%) | Pure protein |

Dengue_Vaccine_Flr 130207A



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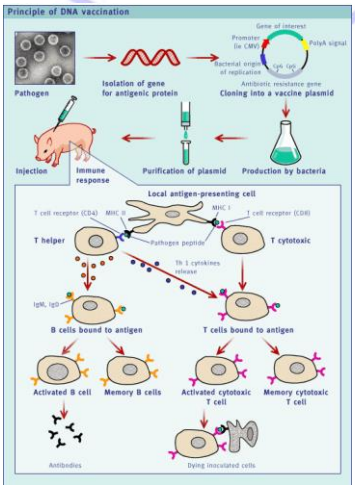
Vaccines are among the greatest achievements of modern medicine. Global use of vaccines have eliminated naturally occurring cases of smallpox, and nearly eliminated polio, while other diseases, such as typhus, rotavirus, hepatitis A and B and others are well controlled. Conventional vaccines, however, only cover a small number of diseases, and infections that lack effective vaccines kill millions of people every year, with AIDS, hepatitis C and malaria being particularly common. **First generation** vaccines are **whole-organism vaccines** – either live and weakened, or killed forms. Live, attenuated vaccines, such as smallpox and polio vaccines, are able to induce killer T-cell (TC or CTL) responses, helper T-cell (TH) responses and antibody immunity. However, there is a small risk that attenuated forms of a pathogen can revert to a dangerous form, and may still be able to cause disease in immuno-compromised vaccine recipients (such as those with AIDS). While killed vaccines do not have this risk, they cannot generate specific killer T cell responses, and may not work at all for some diseases. **Second generation vaccines** consisting of defined protein antigens (such as tetanus or diphtheria toxoid) or recombinant protein components (such as the hepatitis B surface antigen) were developed to minimize risk and cost of the whole cell vaccines. **Subunit vaccines** are also able to generate TH and antibody responses, but not killer T cell responses. DNA vaccine idea started with the landmark discovery of protein expression by the injection of naked DNA into mouse muscle Wolff in 1990. **DNA vaccines** are **third generation vaccines**, and are made up of a small, circular piece of bacterial DNA (called a plasmid) that has been genetically engineered to produce one or two specific proteins (antigens) from a pathogen. The vaccine DNA is injected into the cells of the body, where the "inner machinery" of the host cells "reads" the DNA and uses it to synthesize the pathogen's proteins. Because these proteins are recognized as foreign, when they are processed by the host cells and displayed on their surface, the immune system is alerted, which then triggers a range of immune responses.




Success of the vaccine depends upon high expression of the target antigen from the injected gene (DNA). DNA immunization is able to raise a range of **TH responses**, including lymphoproliferation and the generation of a variety of cytokine profiles. A major advantage of DNA vaccines is the ease with which they can be manipulated to bias the type of T-cell help towards a **TH1 or TH2 response**. The type of T-cell help raised is influenced by the method of delivery and the type of immunogen expressed, as well as the targeting of different lymphoid compartments. Generally, saline needle injections (either IM or ID) tend to induce TH1 responses, while gene gun delivery raises TH2 responses. One of the greatest advantages of DNA vaccines is that they are able to induce **cytotoxic T lymphocytes (CTL)** without the inherent risk associated with live vaccines. CTL responses can be raised against immunodominant and immunorecessive CTL epitopes, as well as subdominant CTL epitopes, in a manner which appears to mimic natural infection. This may prove to be a useful tool in assessing CTL epitopes of an antigen, and their role in providing immunity. The efficiency of DNA immunization can be improved by stabilising DNA against degradation, and increasing the efficiency of delivery of DNA into antigen presenting cells. This has been demonstrated by coating biodegradable cationic microparticles (such as poly(lactide-co-glycolide) formulated with cetyltrimethylammonium bromide) with DNA. Such DNA-coated microparticles can be as effective at raising CTL as recombinant vaccinia viruses, especially when mixed with alum. Alternative delivery methods have included aerosol instillation of naked DNA on mucosal surfaces, such as the nasal and lung mucosa, and topical administration of pDNA to the eye and vaginal mucosa. Mucosal surface delivery has also been achieved using cationic liposome-DNA preparations, biodegradable microspheres, attenuated Shigella or Listeria vectors for oral administration to the intestinal mucosa, and recombinant adenovirus vectors

Naked DNA vaccination usually induces a humoral immune response, characterized by the production of antigen specific antibodies. In general, the antibody level is very low to undetectable after the first DNA injection but increases both with the number of injections and the amount of injected DNA. Neutralizing antibodies have been detected against the viruses (Herpes, JEV etc), bacteria (C. pseudotuberculosis), protozoa (C. pavum, T. annulata etc), and parasites (A. marginale and T. ovis). There are indications that multigenic DNA vaccines containing several plasmids can provide protective immunity.

**DNA Vaccines Status**: Several hundred clinical trials are ongoing at various stages for DNA vaccines. Positive results were announced for a **bird flu DNA vaccine** in 2006 (H5N1). A DNA vaccine to protect horses from West Nile virus (**recombitek, rWNV, Fort Dodge**) has been approved in 2004. rWNV consists of a canarypox virus vector with insertion and expression of the membrane (prM) and envelope (E) proteins of WNV genes. The latest equine vaccine approved in 2006 is a single-dose, attenuated **West Nile virus, live flavivirus chimera vaccine (WN-FV)** (PreveNile; Intervet, De Soto,KS) for horses and is marketed without an adjuvant. The recombinant chimera expresses the E and prM proteins of WNV in a yellow fever vector (YF17D). The vaccine has been labeled for use in horses for the prevention of West Nile virus viremia and as an aid in the prevention of WNV disease and encephalitis. A preliminary study in DNA vaccination against **multiple sclerosis** (**BHT-3009 by Bayhill Therapeutics**) was reported as being effective. The MS vaccine expressed full length human myelin basic protein (MBP) and reduced the levels of autoantibodies to MBS.

Presence of autoantibodies to dsDNA and many other auto antigens is a hallmark of lupus erythematosus (SLE). Humans and animals those are genetically disposed for SLE may easily be induced to make anti-dsDNA antibodies. These antibodies occur essentially only during the course of lupus and serve as markers for diagnosis and prognosis. The importance of anti-dsDNA to disease pathogenesis is substantiated by evidence that they promote glomerulonephritis either by immune complex deposition or the direct binding to cross-reactive renal antigens. Moreover, animal studies have shown that it is easier to mount antibody response to E.coli (heterologous DNA) than to homologous DNA. Anti-bacterial DNA antibodies cross-react with the host (human/animal) DNA and create SLE-like symptoms. DNA-vaccines typically contain foreign DNA (bacterial or viral) and the gene of interest. In addition, many peptides act as DNA-mimitope and produce anti-DNA antibodies. Therefore, it is essential that all DNA-vaccines and recombinant Protein vaccines are tested for their potential to make anti-dsDNA antibodies.
(See Details at the website)
http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

ADI has developed anti-DNA IgG antibody ELISA to test DNA-vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. ELISA kits are also available to measure autoantibodies to various other antigens (RNP, Histone, etc).

## DNA Vaccines & Anti-DNA Antibody ELISA Kits

| Items | Ab isotype | Mouse Cat# | Rat Cat# | Human Cat# | Monkey Cat# |
|---|---|---|---|---|---|
| DNA Vaccine **Anti-dsDNA** IgG ELISA | Ig's (G+A+M) | 5110 | | | 670-100-DNM |
| | IgG (IgG1-3) | 5120 | 650-130-DDN | 3100 | |
| | IgG1 | 5120-1 | | | |
| | IgG2a | 5120-2a | | | |
| | IgG2b | 5120-2b | | | |
| | IgG3 | 5120-3 | | | |
| | IgA | 5120-A | | 3105 | |
| | IgM | 5130 | | 3110 | |
| | IgE | 5120-E | | | |
| DNA Vaccine **Anti-ssDNA** IgG ELISA | Ig's (G+A+M) | 5310 | | | |
| | IgG | 5320 | 650-330-DSN | | |

## DNA Vaccine Antibody Detection

DNA-vaccine typically contain a protein expression vector that is expected to be translated by the host (mouse, human etc). For example, **recombitek, rWNV, Fort Dodge, DNA Vaccine** expresses the membrane (prM) and envelope (E) proteins of West Nile Virus. The success of the vaccine will depend upon the expression of the protein followed by the production of antibodies in mouse or human or other host receiving the DNA vaccine. Serum antibodies are generally detected by direct antigen ELISAs. ADI has produced ELISA kits that contain optimized reagents including the specific antibody conjugates necessary to detect the antibodies. Users will only supply the specific antigen for coating the ELISA plates. Antibody detection can be completed in <2 hours using supplied reagents in the kit.

| Catalog # | Product Description | Product Type |
|---|---|---|
| 80120 | Cervid (Deer, Elk, Moose Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80150 | Mouse Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80155 | Rat Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80160 | Rabbit Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80165 | Goat Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80166 | Sheep Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80170 | Human Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80171 | G. Pig Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80175 | Monkey Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80176 | Chicken Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80177 | Chicken IgY Antibody detection in whole egg yolks ELISA kit, Qualitative | Kit |
| 80180 | Hamster Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80185 | Bovine Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80186 | Pig Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80187 | Turkey Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80188 | Ferret Serum Antibody detection ELISA kit, Qualitative | Kit |
| 80188-A | Ferret Serum antigen-specific IgA Antibody detection and titration ELISA kit | Kit |
| 80188-G | Ferret Serum antigen-specific IgG Antibody detection and titration ELISA kit | Kit |
| 80188-M | Ferret Serum antigen-specific IgM Antibody detection and titration ELISA kit | Kit |



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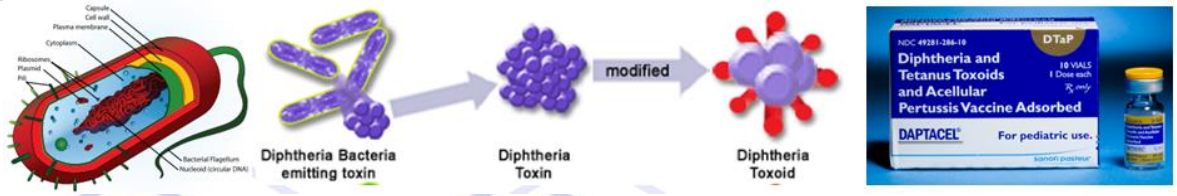
## Diphtheria Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

**Diphtheria** (Greek diphthera)—"pair of leather scrolls") is an upper respiratory tract illness characterized by sore throat, low fever, and an adherent membrane on the tonsils, pharynx, and/or nasal cavity. It is caused by Corynebacterium diphtheria, an aerobic **Gram-positive bacterium**. Diphtheria causes the progressive deterioration of myelin sheaths in the central and peripheral nervous system leading to degenerating motor control and loss of sensation. Diphtheria is a contagious disease spread by direct physical contact or breathing the aerosolized secretions of infected individuals. In the 1920s there were an estimated 100,000 to 200,000 cases of diphtheria per year in the USA, causing 13,000 to 15,000 deaths per year. Children represented a large majority of these cases and fatalities. Common diphtheria has largely been eradicated in industrialized nations through widespread vaccination. **DPT (Diphtheria–Pertussis–Tetanus) vaccine** is recommended for all school aged children. Boosters of the vaccine are recommended for adults since the benefits of the vaccine decrease with age. **Diphtheria toxin** consists of a single polypeptide ~58 Kda. . Proteolysis yields two fragments (A ~21 kda and B ~37 Kda) which are held together by a disulfide bond. The toxin enters the host cell and is hydrolysed by a trypsin-like protease to give a fragment with enzymatic activity. **CRM197** is a non-toxic mutant containing a single amino acid substitution of Glu to Arg. Diphtheria Toxin/Toxoid and CRM197 are immunologically indistinguishable. CRM197 is used as a protein conjugate of several vaccines.




**Diphtheria Vaccines**: Pediarix (DTAP/HepB/IPV), Infanrix (DTAP), Boostrix (Tetanus, Diphtheria, Acellular Pertussis) –GlaxoSmithKline; Trihibit (DTAP/Hib), Daptacel (DTAP), Tripedia (DTAP), DT (Pediatric), Td (Adult), DecavacTM (Tetanus/Diphtheria), Adacel (tetanus, Diphtheria, Acellular Pertussis) Sanofi Pasteur.

It is necessary to monitor the efficacy of vaccines and determine the anti-Diphtheria Ig levels in patients or for clinical trial using new formulation of vaccines. ADI has developed antibody ELISA kits to determine the efficacy of various existing Diphtheria vaccines and test new vaccines. ADI has also introduced **industry's first ELISA for direct testing of Diphtheria Toxoid adsorbed on Alum** (for vaccine identification and testing).

### Diphtheria vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2723

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| **Anti-Diphtheria Toxin/Toxoid ELISA kit** | Human | 940-100-DHG | 940-120-DHM |
| | Mouse | 940-120-DMG | 940-125-DMM |
| | G.pig | 940-140-DGG | 940-145-DGM |
| | Monkey | 940-240-DKG | 940-245-DKM |
| | Rabbit | 940-130-DRG | 940-135-DRM |
| **Anti-CRM197 (Diphtheria Toxin mutant) ELISA kit** | Mouse | 940-220-DMG | 940-225-DMM |
| | Rabbit | 940-230-DRG | 940-235-DRM |
| | Human | 940-200-DHG | 940-210-DHM |

VacciGel Direct ELISA for the measurement of **Diphtheria Toxoid in Vaccines formulated in Alum**, 96 tests, Cat # VAC-DTX-200

Diphtheria Toxoid/Toxin (DTX) ELISA for the measurement **DTX in biological buffer**, cat # VAC-DTX-210

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Diphtheria Toxoid/Toxin | CRM197-N-100 | Purified CRM197 (Diphtheria Toxin mutant) protein (antigen grade) | Pure Protein |
| | DTOX11-S | Rabbit Anti-Diphtheria Toxoid/Toxin antiserum | Antibodies |
| | DTOX12-B | Goat Anti-Diphtheria Toxoid/Toxin IgG-Biotin conjugate | Antibodies |
| | DTOX12-F | Goat Anti-Diphtheria Toxoid/Toxin IgG-FITC conjugate | Antibodies |
| | DTOX12-HRP | Goat Anti-Diphtheria Toxoid/Toxin IgG-HRP conjugate | Antibodies |
| | DTOX12-S | Goat Anti-Diphtheria Toxoid/Toxin IgG, unlabeled | Antibodies |
| | DTOX13-M | Monoclonal Anti-Diphtheria Toxin/Anatoxin IgG #1, unlabeled | Antibodies |
| | DTOX15-M | Monoclonal Anti-Diphtheria Toxin subunit A IgG, unlabeled | Antibodies |
| | DTOX15-N-500 | Purified Diphtheria Toxoid protein (antigen grade) | Pure Protein |
| | DTOX16-M | Monoclonal Anti-Diphtheria Toxin (non-reactive with free A/B subunits) IgG | Antibodies |
| | DTOX16-S | G. Pig Anti-Diphtheria Toxoid/Toxin antiserum | Antibodies |

Diphtheria_Vaccine_Flr 130207A



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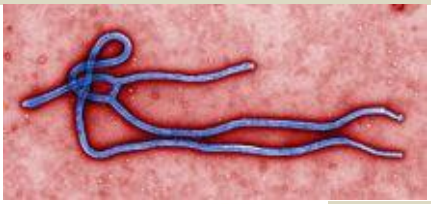
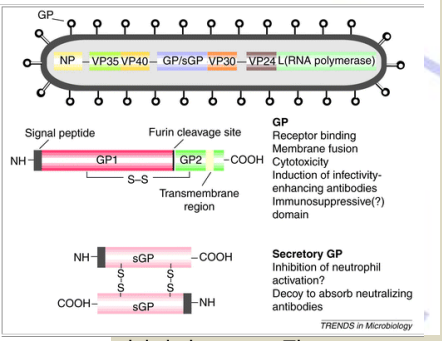
## Zaire-Ebola Virus Vaccine ELISA Kits, Recombinant Proteins, and Antibodies

**Ebola virus** (EBOV) causes severe disease in humans and in nonhuman primates in the form of viral hemorrhagic fever. The name Ebola virus is derived from the Ebola River (a river that was at first thought to be in close proximity to the area in Zaire where the first recorded Ebola virus disease outbreak occurred) and the taxonomic suffix virus. Zaire ebolavirus is a virological taxon included in the genus Ebolavirus, family Filoviridae, order Mononegavirales. The species has a single virus member, Ebola virus (EBOV). Ebolavirus species Zaire (ZEBOV) causes highly lethal hemorrhagic fever, resulting in the death of 90% of patients within days. Most information on immune responses to ZEBOV comes from in vitro studies and animal models. Ebola Zaire attacks every organ and tissue in the human body except skeletal muscle and bone. Ebola is classified as a Level 4 pathogen (higher than AIDS) with a 2 to 21 day (7 to 14 days average) incubation period. There are currently four known strains of Ebola: Zaire, Sudan, Reston and Tai. All cause illness in sub-human primates. Only Ebola Reston does not cause illness in humans. The mortality rate of Ebola victims is between 60% and 90%; with Ebola Sudan at 60% and Ebola Zaire at 90%.



The virions are tubular in general form but variable in overall shape and may appear as the classic shepherd's crook or eyebolt, as a U or a 6, or coiled, circular, or branched. Ebolavirions consist of seven structural proteins. At the center is the helical ribonucleocapsid, which consists of the genomic RNA wrapped around a polymer of **nucleoproteins (NP).** Associated with the ribonucleoprotein is the RNA-dependent RNA polymerase (L) with the polymerase cofactor (VP35) and a transcription activator (VP30). The ribonucleoprotein is embedded in a matrix, formed by the major (VP40) and minor (VP24) matrix proteins. These particles are surrounded by a lipid membrane derived from the host cell membrane. The membrane anchors a glycoprotein (GP1,2) that projects 7 to 10 nm spikes away from its surface. While nearly identical to marburgvirions in structure, ebolavirions are antigenically distinct. Being acellular, viruses do not grow through cell division; instead, they use the machinery and metabolism of a host cell to produce multiple copies of themselves, and they assemble in the cell.




**EVD** is clinically indistinguishable from Marburg virus disease (MVD), and it can also easily be confused with many other diseases prevalent in Equatorial Africa, such as other viral hemorrhagic fevers, falciparum malaria, typhoid fever, shigellosis, rickettsial diseases such as typhus, cholera, gram-negative septicemia, borreliosis such as relapsing fever or EHEC enteritis. The most common diagnostic methods are therefore RT-PCR in conjunction with antigen-capture ELISA which can be performed in field or mobile hospitals and laboratories. **Vaccines** have successfully protected nonhuman primates; however, the six months needed to complete immunization made it impractical in an epidemic. In 2003, a vaccine using an adenoviral (ADV) vector carrying the Ebola spike protein was tested on crab-eating macaques. The monkeys were challenged with the virus 28 days later, and remained resistant. In 2005, a vaccine based on attenuated recombinant vesicular stomatitis virus (VSV) vector carrying either the Ebola glycoprotein or Marburg glycoprotein successfully protected nonhuman primates, opening clinical trials in humans. There are currently **no Food and Drug Administration-approved vaccines** for the prevention of EVD. The most promising ones are DNA vaccines or are based on adenoviruses, vesicular stomatitis Indiana virus (VSIV) or filovirus-like particles (VLPs) as all of these candidates could protect nonhuman primates from ebolavirus-induced disease. DNA vaccines, adenovirus-based vaccines, and VSIV-based vaccines have entered clinical trials.

ADI has cloned and expressed Ebola virus nucleoprotein (~720 aa, ~82 kda, full length) that is highly antigenic and made appropriate antibodies. Antibody ELISA kit was developed to determine the efficacy of various existing vaccines and test new vaccines. These kits help determine the levels of Ebola virus nucleoprotein antibody during natural infection or in vaccinated individuals.

**Notes**: None of the reagents used in the kit are derived from Ebola virus or ever exposed to the virus. The proteins are recombinant and antibodies developed in experimental animals such as mouse and rabbits. So there is no cause for any concerns in using the Ebola virus antibody ELISA kits.

### Zaire-Ebola vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2762

| ELISA Kit Description | Species | Total Ig's | IgG Specific Cat# | IgM Specific Cat# |
|---|---|---|---|---|
| Zaire-Ebola Virus Vaccine antibody ELISA | Rabbit | | AE-320540-1 | |
| | Mouse | | AE-320500-1 | AE-320510-1 |
| | Human | | AE-320520-1 | AE-320530-1 |
| | Monkey | | AE-320550-1 | AE-320560-1 |

### Zaire-Ebola vaccine Related Antibodies, Proteins and other Reagents

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Zaire-Ebola virus proteins and antibodies | ZEV11-C | Recombinant Zaire-Ebola virus nucleoprotein protein control for Western | Western control |
| | ZEV11-S | Rabbit Anti-Zaire-Ebola virus nucleoprotein protein protein antiserum | Antiserum |
| | ZEV12-M | Monoclonal Anti-Zaire-Ebola virus IgG, aff pure | Antibodies |
| | ZEV15-R-10 | Recombinant (E.coli) Zaire-Ebola virus nucleoprotein protein(full length 82 kda), purified | Antigen protein |

Zaire-Ebola_Vaccine_Flr Rev. 130207A



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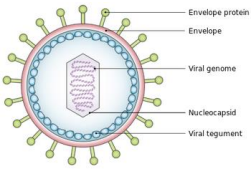
# Human Anti-Epstein Barr Virus (EBV) ELISA Kits

## General Information




The **Epstein–Barr virus (EBV)**, also called human herpesvirus 4 (HHV-4), is a virus of the herpes family, and is one of the most common viruses in humans. It is named after Michael Anthony Epstein and Yvonne Barr who together discovered and documented the virus. The virus is a dsDNA virus (122-180 nm, 172Kb, ~85 genes) wrapped in a protein capsid. The capsid is surrounded by a tegument made of protein, which in turn is surrounded by an envelope made from lipids. The viral envelope contains glycoproteins (gp42, gp220, gp350), which are essential to infection of the host cells (T cells, natural killer cells, and smooth muscle cells). All EBV nuclear proteins are produced by alternative splicing of a transcript starting at either the Cp or Wp promoters at the left end of the genome (in the conventional nomenclature). The genes are ordered EBNA-LP/EBNA-2/EBNA-3A/EBNA-3B/EBNA-3C/EBNA-1 within the genome. EBNA-1 protein binds to a replication origin (oriP) within the viral genome and mediates replication and partitioning of the episome during division of the host cell. It is the only viral protein expressed during group I latency.

EBV can be divided into two major types, EBV type 1 and EBV type 2. These two subtypes have different EBNA-3 genes. As a result, the two subtypes differ in their transforming capabilities and reactivation ability. Type 1 is dominant throughout most of the world, but the two types are equally prevalent in Africa. Infection with EBV occurs by the oral transfer of saliva and genital secretions. EBNA-1 protein binds to a replication origin (oriP) within the viral genome and mediates replication and partitioning of the episome during division of the host cell. It is the only viral protein expressed during group I latency. EBV infects B cells of the immune system and epithelial cells. Once the virus's initial lytic infection is brought under control, EBV latently persists in the individual's B cells for the rest of the individual's life. The EBV has been implicated in several diseases that include infectious mononucleosis, Burkitt's lymphoma, Hodgkin's lymphoma, nasopharyngeal carcinoma, multiple sclerosis, and lymphomatoid granulomatosis. Also in disorders related to alpha-synuclein aggregation (e.g. Parkinson's disease, dementia with Lewy bodies and multiple system atrophy. Symptoms of infectious mononucleosis are fever, sore throat, and swollen lymph glands. Sometimes, a swollen spleen or liver involvement may develop. Heart problems or involvement of the central nervous system occurs only rarely, and infectious mononucleosis is almost never fatal. The clinical diagnosis of infectious mononucleosis is suggested on the basis of the symptoms of fever, sore throat, swollen lymph glands, and the age of the patient.

The optimal combination of serologic testing consists of the titration of four markers: IgM and IgG to the viral capsid antigen (**VCA**), IgM to the **early antigen (EA),** and antibody to EBV nuclear antigen-1 (**EBNA-1**). IgM to VCA appears early in infection and disappears within 4 to 12 weeks. IgG to VCA appears in the acute phase, peaks at 2 to 4 weeks after onset, declines slightly, and then persists for life. Anti-EA IgG appears in the acute phase of illness and generally falls to undetectable levels after 3 to 6 months. In many people, detection of antibody to EA is a sign of active infection. If antibodies to the viral capsid antigen are not detected, the patient is susceptible to EBV infection.

No approved **EBV vaccine** currently available. Several vaccines using EBV Gp350/220 and MVA-EL (modified vaccine Ankara-expressing EBV antigens: 280-aa from the C-terminus of EBNA1 and the full 497-aa LMP2A fusion proteins) are in clinical trials.

## Related ELISA kits available from ADI

| ELISA Type | Species | IgA | IgG | IgM |
|---|---|---|---|---|
| EBV EBNA-1 ELISA kit, 96 tests | Human | 510-200-HEA | 510-205-HEG | 510-210-HEM |
| EBV EA ELISA kit, 96 tests | Human | 510-215-HEA | 510-220-HEG | 510-225-HEM |
| EBV VCA ELISA kit, 96 tests | Human | 510-230-HEA | 510-235-HEG | 510-240-HEM |

HEA-EBV flr Rev. 150109P

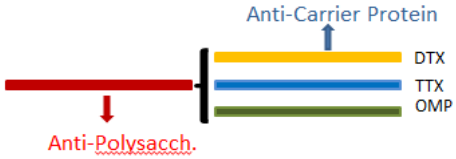
## Haemophilus influenzae B (Hib) Vaccines Antibody ELISA Kits and Reagents

**Haemophilus influenzae type B vaccine** (Hib janan or PRP vaccine is a conjugate vaccine developed for the prevention of invasive disease caused by Haemophilus influenzae type b bacteria. Vaccinations against Haemophilus influenzae (Hib) have decreased early childhood meningitis significantly in developed countries and recently in developing countries.

In 1930, 2 major categories of H. influenzae were defined: the unencapsulated strains and the encapsulated strains. Encapsulated strains were classified on the basis of their distinct capsular antigens. There are six generally recognized types of encapsulated H. influenzae: a, **b,** c, d, e, and f. Genetic diversity among unencapsulated strains is greater than within the encapsulated group. The presence of the capsule in encapsulated type b (Hib), a serotype causing conditions such as epiglottitis, is known to be a major factor in virulence. Their capsule allows them to resist phagocytosis and complement-mediated lysis in the non-immune host. Vaccination with Hib conjugate vaccine is effective in preventing Hib infection. Most strains of H. influenzae are opportunistic pathogens. Naturally-acquired disease caused by H. influenzae seems to occur in humans only. In infants and young children, H. influenzae type b (Hib) causes bacteremia, pneumonia, and acute bacterial meningitis. Occasionally, it causes cellulitis, osteomyelitis, epiglottitis, and infectious arthritis. Due to routine use of the Hib conjugate vaccine in the U.S. since 1990, the incidence of invasive Hib disease has decreased to 1.3/100,000 in children. However, Hib remains a major cause of lower respiratory tract infections in infants and children in developing countries where vaccine is not widely used.

ActHib (Sanofi)


PedavaxHib (PRP-OMP)
Merck



Hib Vaccine Polysaccharide conjugated to various carrier protein

Several vaccines are now available for routine use against Hib.that can be used alone or in combination with other diseases (multivalent). Earlier polysaccharide vaccines only produced age-dependent and variable immunity. The shortcomings of the polysaccharide vaccine led to the production of the Hib polysaccharide-protein conjugate vaccine. There are currently three types of **conjugate vaccine** utilizing different proteins in the conjugation process, all of which are highly effective: tetanospasmin (also called tetanus toxin), mutant diphtheria protein, and meningococcal group B outer membrane protein. Hib vaccine combined with diphtheria-tetanus-pertussis-polio vaccines and Hepatitis B vaccines are available in the US. The World Health Organization (WHO) has certified several Hib vaccine combinations, including a pentavalent diphtheria-pertussis-tetanus-hepatitis B-Hib, for use in developing countries.

Hib conjugate vaccines have been shown to be universally effective against all manifestations of Hib disease, with a clinical efficacy among fully vaccinated children estimated to be between 95-100%. The vaccine has also been shown to be immunogenic in patients at high risk of invasive disease. Hib vaccine is not effective against non-type B Haemophilus influenzae. However, non-type B disease is rare in comparison to pre-vaccine Haemophilus influenzae type B disease.

It is necessary to monitor the efficacy of vaccines and determine the anti-H. influenza B IgG levels in patients or for clinical trials using new formulation of vaccines. ADI has developed industry's first ELISA kit to determine the antibodies to Hib vacdcine's PRP only. ADI also have separate ELISA kit to measure antibodies to Diphtheria Toxoid, Tetanus Toxoid or HBsAg (the PRP-carrier proteins). 's mouse Anti- H. influenza B PRP IgG ELISA kit is an immunoassay for the quantitative determination of IgG class antibodies against PRP using the following vaccines:.

**Hib Vaccines**: Influenzae B Comvax (HepB/Hib; Merck), PedvaxHib (Hib-PRP-OMP) –Merck; Trihibit (DTAP/Hib), ActHib (Hib-PRP-T) - Sanofi Pasteur; HibTiter (Hib-Hboc) – WyethLederle

### Hib Vaccine Related Reagents and ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2725

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| Hib Vaccine Anti-Polyribosyl phosphate (**PRP**) Antibody ELISA Kit<br>**Note**: this kit measure antibody to the PRP-moiety and not the conjugated proteins. | Human | 980-100-PHG | |
| | Monkey | 980-150-PKG | |
| | Mouse | 980-120-PMG | |
| | Rabbit | 980-130-PRG | 980-140-PRM |

### H.influenzae (Hib) Related Antibodies, Peptides, and Recombinant Proteins Ordering Information

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2725

| Item | Catalog # | Product Description | Product Type |
|---|---|---|---|
| Haemophilus influenzae, Type B antibodies | HIB12-S | Rabbit Anti-Haemophilus influenzae, Type B (heat killed, whole bacteria) antiserum | Antibodies |
| | PRPB11-S | Rabbit Anti-Haemophilus influenzae, Type B PRP (Hib-PRP) antiserum | Antibodies |



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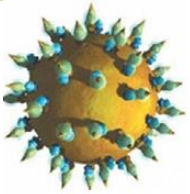
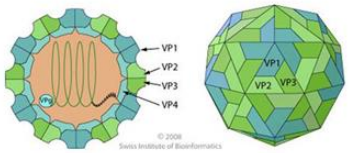
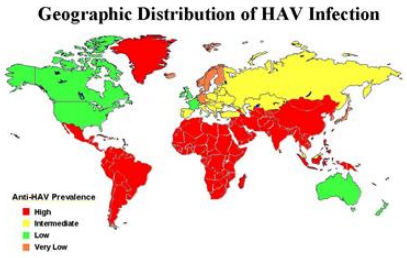
## Hepatitis A Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

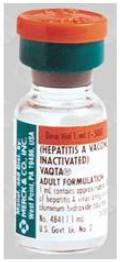
Hepatitis A is a self-limited disease and chronic stage or other complications are rare. Infections occur early in life in areas with poor sanitation and crowded living conditions. With improved sanitation and hygiene, infections are delayed and consequently the number of persons susceptible to the disease increases. Because the disease is transmitted through the fecal-oral route, in dense populated regions an outbreak can arise from single contaminated source. The Hepatitis virus (HAV) is a Picornavirus; it is non-enveloped and contains a single-stranded RNA packaged in a protein shell. HAV has four major, structural polypeptides (**VP1-4**; 60 copies of VP1, 30-33 kD; VP2, 24-30 kD; VP3 (21-28 kD) and it localizes exclusively in the cytoplasm of human hepatocytes. The infection with HAV induces strong immunological response and elevated levels first of IgM and then IgG are detectable within a few days after the onset of the symptoms. IgG is an indicator of past infection and immunity to HAV. HAV virus is detected by the presence of HAV antigens or antibodies using ELISA. HAV occurs endemically in all parts of the world. At least 1.5 million new cases are reported each year.










**Hepatitis A vaccines** : Hepatitis A is the most common vaccine-preventable virus acquired during travel, so people travelling to places where the virus is common like the Indian Subcontinent, Africa, Central America, South America, the far East, and Eastern Europe should also be vaccinated. Protection is proven to last at least 10 years and is estimated to last 21 to 27 years if the full course is administered. Three vaccines are manufactured from cell-culture-adapted HAV propagated in human fibroblasts. Following purification from cell lysates, the HAV preparation is formalin-inactivated and adsorbed to an aluminium hydroxide adjuvant.

**Avaxim**: made by Sanofi Pasteur. Inactivated Hepatitis A virus produced in MRC-5 cells. **Epaxal**: made by Crucell. Also sold under the brand names **HAVpur and VIROHEP-A**. This vaccine consists of virosomes, artificial particles composed of synthetic lipids and influenza proteins in addition to the Hepatitis A antigen. It does not contain aluminium. **Havrix**: made by GlaxoSmithKline. Inactivated Hepatitis A virus produced in MRC-5 cells. **Vaqta**: made by Merck. Inactivated Hepatitis A virus produced in MRC-5 cells.

ADI's HAV ELISA kit is an enzyme linked-immunosorbent assay (ELISA) for qualitative determination of human hepatitis A virus (HAV-IgG) in serum or plasma. This kit is designed to determine the efficacy of existing HAV vaccines or new formulations. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. Various HAV recombinant proteins and antibodies are also available to further research into HAV subunit Vaccine.

### Hepatitis A vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2730

| Items Description | Species | Antibody Type IgG Cat# |
|---|---|---|
| Anti-Hepatitis A Virus (**HAV**) ELISA kit, Qualitative, 5x96 tests | Human | 4300-AHG |

### Hepatitis A Recombinant Proteins and Antibodies

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Hepatitis A Virus proteins and antibodies | HAV11-M | Mouse anti-Hepatitis A Virus (HAV) IgG, clone 1 | Antibodies |
| | RP-436 | Recombinant Hepatitis A Virus (HAV) VP4-VP2 | Recombinant protein |
| | RP-437 | Recombinant Hepatitis A Virus (HAV) VP3 | Recombinant protein |
| | RP-438 | Recombinant Hepatitis A Virus (HAV) VP1 | Recombinant protein |
| | RP-439 | Recombinant Hepatitis A Virus (HAV) VP1-P2A (722-830) | Recombinant protein |
| | RP-440 | Recombinant Hepatitis A Virus (HAV) P2C | Recombinant protein |
| | RP-441 | Recombinant Hepatitis A Virus (HAV) P2C-P3B | Recombinant protein |
| | RP-442 | Recombinant Hepatitis A Virus (HAV) P3C | Recombinant protein |
| | RP-443 | Recombinant Hepatitis A Virus (HAV) VP1-P2A (669-782) | Recombinant protein |
| | RP-444 | Recombinant Hepatitis A Virus (HAV) P2C-P3A | Recombinant protein |

HAV_Vaccine_Flr 130207A

## Hepatitis B Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Hepatitis B is an infectious inflammatory illness of the liver caused by the **hepatitis B virus (HBV**) that affects hominoidea, including humans. Originally known as "serum hepatitis", the disease has caused epidemics in parts of Asia and Africa, and it is endemic in China. About a third of the world population has been infected at one point in their lives, including 350 million who are chronic carriers. Hepatitis B virus is an **hepadnavirus**—hepa from hepatotropic (attracted to the liver) and dna because it is a DNA virus. Although replication takes place in the liver, the virus spreads to the blood where viral proteins and antibodies against them are found in infected people.


The virus particle, (virion) consists of an outer lipid envelope and an icosahedral **nucleocapsid** core composed of protein. The nucleocapsid encloses the viral DNA and a DNA polymerase that has reverse transcriptase activity similar to retroviruses. The outer envelope contains embedded proteins which are involved in viral binding of, and entry into, susceptible cells. The virus is one of the smallest enveloped animal viruses There are four known genes encoded by the genome, called C, X, P, and S. The core protein is coded for by gene C (**HBcAg**). **HBeAg** is produced by proteolytic processing of the pre-core protein. The DNA polymerase is encoded by gene P. Gene S is the gene that codes for the surface antigen (**HBsAg**). The HBsAg gene is one long open reading frame but divided into three sections, **pre-S1, pre-S2, and S**. Because of the multiple start codons, polypeptides of three different sizes called large, middle, and small (**pre-S1 + pre-S2 + S, pre-S2 + S, or S**) are produced. The hepatitis B surface antigen (HBsAg) is most frequently used to screen for the presence of this infection. It is the first detectable viral antigen to appear during infection. **Hepatitis B vaccine** is a vaccine developed for the prevention of hepatitis B virus infection. The vaccine contains the viral envelope proteins, hepatitis B surface antigen (HBsAg). Presently **recombinant DNA vaccines** are available, which means they are produced by inserting the gene for HBV into common baker's yeast where it is grown, harvested, and purified. HBV infection cannot occur from receiving hepatitis B vaccine. The common brands available are **Hiberix** and **Engerix-B** (GSK), **Recombivax** (Merck) **Elovac B** (Human Biologicals Institute), **Genevac B (**Serum Institute), **Shanvac B** etc.

ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. **Vaccigel HBsAg ELISA is industry's first ELISA for the direct measure of the antigen adsorbed on Alum (Hepatitis Vaccine)**.

**Hepatitis B vaccine Related ELISA kits**

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| **Hepatitis B Vaccine** (HBsAg antibody) ELISA kits | Human | 4200 | 4205 |
| | Human | 4220-AHB | |
| | Human | 4230-AHB-R (rapid Test) | |
| | Mouse | 4210 | 4215 |
| | Rabbit | 4240 | |
| Hepatitis B vaccine (**HBsAg**) ELISA kit for the detection of antigen in human serum (qualitative) cat #4105 | | | |
| Hepatitis B vaccine (**HBsAg**) ELISA kit for the detection of Recombinant HBsAg (quantitative) Cat #4110 | | | |
| **VacciGel Direct** ELISA for the measurement of Hepatitis B Vaccine (HBsAg) **formulated in Alum,** #VAC-HBS-100 | | | |

**Hepatitis B vaccine Related Antibodies and Reagentes kits**

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Hepatitis B | AB-15010 | Mouse Anti-Hepatitis B Virus (AD & AY Antigens) IgG | Antibodies |
| | AB-16310 | Anti-Hepatitis B Surface Antigen A (HBsAg) IgG | Antibodies |
| | AR-233-U | Hepatitis B Virus (HBV) Polymerase (P protein) (A9), RNA Aptamer, unlabeled | RNA Aptamers |
| | HBSAG15-N | Hepatitis B surface Antigen (HBsAg) - Ay (High Pure) | Pure protein |
| | HBSAG18-N | Hepatitis B surface Antigen (HBsAg) - Ad (High Pure) | Pure protein |
| | HBSAG19-R-1 | Recombinant purified Hepatitis B surface Antigen (HBsAg) | Purified antigen |
| | RP-342 | Mouse Recombinant Anti-Hepatitis B Virus Surface Antigen (HBsAg) Ck IgG | Antibodies |
| | RP-445 | Recombinant Hepatitis B Surface Antigen ayw subtype, Saccharomyces | Pure protein |
| | RP-446 | Recombinant Hepatitis B Surface Antigen preS1 | Pure protein |
| | RP-448 | Recombinant Hepatitis B Surface Antigen adr subtype, Saccharomyces | Pure protein |
| | RP-449 | Recombinant Hepatitis B Surface Antigen preS2 | Pure protein |
| | RP-450 | Recombinant Hepatitis B Surface Antigen adr subtype, CHO | Pure protein |
| | RP-451 | Recombinant Hepatitis B Surface Antigen ayw subtype, pichia | Pure protein |
| | SP-102028-1 | Hepatitis B Virus Receptor Binding Fragment | Pure Peptide |



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# Hepatitis C Vaccines (HCV) Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Hepatitis C is an infectious disease affecting primarily the liver, caused by the hepatitis C virus (HCV). The hepatitis C virus (HCV) is a small, enveloped, single-stranded, positive-sense RNA virus.[4] It is a member of the hepacivirus genus in the family Flaviviridae. There are seven major genotypes of HCV, which are indicated numerically from one to seven. In the United States, about 70% of cases are caused by genotype 1, 20% by genotype 2, and about 1% by each of the other genotypes. Genotype 1 is also the most common in South America and Europe. The infection is often asymptomatic, but chronic infection can lead to scarring of the liver and ultimately to cirrhosis, which is generally apparent after many years. In some cases, those with cirrhosis will go on to develop liver failure, liver cancer or life-threatening esophageal and gastric varices.

HCV is spread primarily by blood-to-blood contact associated with intravenous drug use, poorly sterilized medical equipment and transfusions. An estimated 130–170 million people worldwide are infected with hepatitis C. The existence of hepatitis C (originally "non-A non-B hepatitis") was postulated in the 1970s and proven in 1989. Hepatitis C only infects humans and chimpanzees.

The virus persists in the liver in about 85% of those infected. This persistent infection can be treated with medication: the standard therapy is a combination of peg interferon and ribavirin, with either boceprevir or telaprevir added in some cases. Overall, 50–80% of people treated are cured. Those who develop cirrhosis or liver cancer may require a liver transplant. Hepatitis C is the leading cause of liver transplantation, though the virus usually recurs after transplantation. No vaccine against hepatitis C is available.

ADI has developing antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. Recombinant proteins from various HCV genotypes and antibodies are available to further research into the development of HCV vaccines.

## Hepatitis C vaccine Related Antibodies and Reagentes kits

| Catalog# | Product Description | Product Type |
|---|---|---|
| AB-15610 | Mouse Anti-Hepatitis C Virus (HCV) NS3 IgG | Antibodies |
| HCV16-R | Recombinant (P. pastoris) HCV core protein (N-term 120 aa, ~16 Kda) (insoluble) | Rec. Protein |
| HCV21-R | Recombinant (E. coli, his-tag) HCV core protein Mosaic (nucleocapsid immunodominant regions) | Rec. Protein |
| HCV23-R | Rec. (E. coli) HCV Antigen mosaic (Core1b, Core 3g, NS3, NS41, NS411, & NC5) (insoluble) | Rec. Protein |
| HCV36-R | Recombiant (E. coli) HCV Antigens-GST fusion protein (mosaic of several antigenic epitopes) | Rec. Protein |
| HNS35-R | Recombinant (E. coli) Hepatitis C Virus (HCV) NS3 protein (insoluble) | Rec. Protein |
| HNS36-R | Recombinant (E. coli) Hepatitis C Virus (HCV) NS3 Helicase, protein (soluble) | Rec. Protein |
| HNS37-R | Recombinant (E. coli) HCV NS3 1a helicase protein (full lengthc33c) immunodomnant regions | Rec. Protein |
| HNS45-R | Recombinant (E. coli) HCV NS4 protein, fragments of the NS4 immunodominant region derived from 11 Hepatitis C Virus (HCV) genotypes, (soluble) | Rec. Protein |
| HNS55-R | Recombinant (E. coli) HCV NS5 protein, fragments of the NS5 immunodominant regions, (soluble) | Rec. Protein |
| RP-457 | Rec. ant Hepatitis C Virus (HCV) NS4 a+b, Biotin | Rec. Protein |
| RP-458 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-3/10 | Rec. Protein |
| RP-459 | Recombinant Hepatitis C Virus (HCV) NS4 | Rec. Protein |
| RP-460 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-1a | Rec. Protein |
| RP-461 | Recombinant Hepatitis C Virus (HCV) NS3 Gen.1b | Rec. Protein |
| RP-462 | Rec. Hepatitis C Virus (HCV) NS4 Mosaic | Rec. Protein |
| RP-463 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-1a (2322-2423) | Rec. Protein |
| RP-464 | Recombinant Hepatitis C Virus (HCV) Combined | Rec. Protein |
| RP-465 | Rec. Hepatitis C Virus (HCV) NS3 Genotype-1c | Rec. Protein |
| RP-466 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-2c (1192-1459) | Rec. Protein |
| RP-467 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-2b (1192-1459) | Rec. Protein |
| RP-468 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-6a (1192-1459) | Rec. Protein |
| RP-469 | Rec. Hepatitis C Virus (HCV) NS3 Genotype-5a | Rec. Protein |
| RP-470 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-1 | Rec. Protein |
| RP-471 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-2a | Rec. Protein |
| RP-472 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-3a | Rec. Protein |
| RP-473 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-4 | Rec. Protein |
| RP-474 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-5 | Rec. Protein |
| RP-475 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-6a | Rec. Protein |
| RP-476 | Recombinant Hepatitis C Virus (HCV) NS5 Gen.1 | Rec. Protein |
| RP-478 | Recombinant Hepatitis C Virus (HCV) NS4, Horseradish Peroxidase Labeled | Rec. Protein |

| Catalog# | Product Description | Product Type |
|---|---|---|
| RP-479 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-3 | Rec. Protein |
| RP-480 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-4 | Rec. Protein |
| RP-481 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-5 | Rec. Protein |
| RP-482 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-6 | Rec. Protein |
| RP-483 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) 22kDa, Biotin | Rec. Protein |
| RP-484 | Recombinant Hepatitis C Virus (HCV) NS4 a+b, Rhodamine Labeled | Rec. Protein |
| RP-485 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-1a | Rec. Protein |
| RP-486 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-1b | Rec. Protein |
| RP-487 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-2 | Rec. Protein |
| RP-488 | Recombinant Hepatitis C Virus (HCV) NS5 Gen. 2a | Rec. Protein |
| RP-489 | Recombinant Hepatitis C Virus (HCV) NS5 Gen. 3a | Rec. Protein |
| RP-490 | Recombinant Hepatitis C Virus (HCV) NS5 Gen. 3a | Rec. Protein |
| RP-491 | Recombinant Hepatitis C Virus (HCV) NS5 Gen. -3b | Rec. Protein |
| RP-492 | Recombinant Hepatitis C Virus (HCV) NS5 Genotype-6a | Rec. Protein |
| RP-493 | Recombinant Hepatitis C Virus(HCV) NS5 | Rec. Protein |
| RP-494 | Recombinant Hepatitis C Virus (HCV) NS5, Biotin | Rec. Protein |
| RP-495 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-2b | Rec. Protein |
| RP-496 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-3b | Rec. Protein |
| RP-497 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) (105-302) | Rec. Protein |
| RP-498 | Rec. Hepatitis C Virus (HCV) Nucleocapsid (core) 24 | Rec. Protein |
| RP-499 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) 22kDa | Rec. Protein |
| RP-501 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core), Horseradish Peroxidase Labeled | Rec. Protein |
| RP-502 | Recombinant Hepatitis C Virus (HCV) NS3, Biotin | Rec. Protein |
| RP-503 | Recombinant Hepatitis C Virus (HCV) Nucleocapsid (core) Genotype-1b | Rec. Protein |
| RP-504 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-1a (1192-1459) | Rec. Protein |
| RP-505 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-1b (1192-1459) | Rec. Protein |
| RP-506 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-1a (1356-1459) | Rec. Protein |
| RP-507 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-1b (1356-1459) | Rec. Protein |
| RP-508 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-2b (1356-1459) | Rec. Protein |
| RP-509 | Recombinant Hepatitis C Virus (HCV) NS3 Genotype-3 (1356-1459) | Rec. Protein |
| RP-510 | Rec. HCV NS3 Genotype-4 (1356-1459) | Rec. Protein |
| RP-511 | Rec. HCV NS3 Genotype-5 (1356-1459) | Rec. Protein |
| RP-512 | Rec. HCV NS3 Genotype-6 (1356-1459) | Rec. Protein |



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## Hepatitis E Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Hepatitis E is a viral hepatitis (liver inflammation) caused by infection with a virus called hepatitis E virus (HEV). HEV is a positive-sense single-stranded RNA icosahedral virus with a 7.5 kilobase genome. The hepatitis E virus is transmitted mainly through the faecal-oral route due to faecal contamination of drinking water. Other transmission routes have been identified, which include: food borne transmission from ingestion of products derived from infected animals; zoonotic transmission from animals to humans; transfusion of infected blood products and vertical transmission from a pregnant woman to her fetus. Although humans are considered the natural host for the hepatitis E virus, antibodies to the hepatitis E virus or closely related viruses have been detected in primates and several other animal species.

Hepatitis E is a waterborne disease, and contaminated water or food supplies have been implicated in major outbreaks. The ingestion of raw or uncooked shellfish has also been identified as the source of sporadic cases in endemic areas.

The risk factors for hepatitis E are related to poor sanitation in large areas of the world and shedding of the hepatitis E virus in faeces. Infection with this virus was first documented in 1955 during an outbreak in New Delhi, India. The hepatitis E virus is transmitted mainly through contaminated drinking water. It is usually a self-limiting infection and resolves within 4–6 weeks. Occasionally, a fulminant form of hepatitis develops (acute liver failure), which can lead to death. Globally, there are approximately 20 million incident hepatitis E infections every year. A preventative vaccine (HEV 239) is approved for use in China.

There is no available treatment capable of altering the course of acute hepatitis. Prevention is the most effective approach against the disease.

As hepatitis E is usually self-limiting, hospitalization is generally not required. However, hospitalization is required for people with fulminant hepatitis and should also be considered for infected pregnant women.

ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. Vaccigel HBsAg ELISA is industry's first ELISA for the direct measure of the antigen adsorbed on Alum (Hepatitis Vaccine).

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

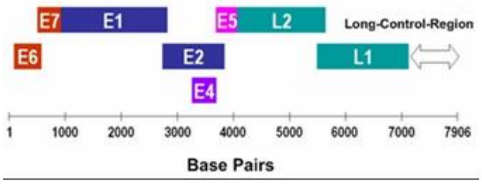
## Hepatitis E vaccine Related products

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| **Hepatitis E proteins** | RP-528 | Recombinant Hepatitis E Virus (HEV) ORF2 (452-617) | Recomb. protein |
| | RP-529 | Recombinant Hepatitis E Virus (HEV) ORF2 (633-659) | Recomb. protein |
| | RP-530 | Recombinant Hepatitis E Virus (HEV) ORF2 (403-461) | Recomb. protein |
| | RP-531 | Recombinant Hepatitis E Virus (HEV) ORF3 | Recomb. protein |
| | RP-532 | Recombinant Hepatitis E Virus (HEV) Mosaic-S ORF2/ORF3 33kDa | Recomb. protein |

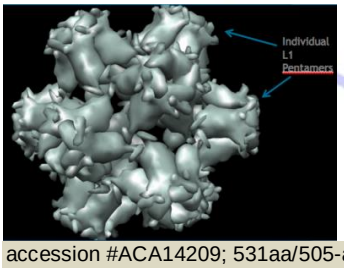
Rev 160310SV

## Human Papilloma Virus (HPV) Vaccine: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Human papillomavirus (HPV) is a virus from the papillomavirus family of viruses that is capable of infecting humans. Like all papillomaviruses, HPVs establish productive infections only in keratinocytes of the skin or mucous membranes. While the majority of the nearly 200 known types of HPV cause no symptoms in most people, some types can cause warts (verrucae), while others can lead to cancers of the cervix, vulva, vagina, and anus in women or cancers of the anus and penis in men. HPV infection is a cause of nearly all cases of cervical cancer. Over 120 HPV types have been identified and are referred to by number. Types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, and 59 are "high-risk" sexually transmitted HPVs. Two vaccines are available to prevent infection by some HPV types: **Gardasil**, marketed by Merck, and **Cervarix**, marketed by GlaxoSmithKline. Both vaccines utilize recombinant L1 proteins and protect against initial infection with HPV types 16 and 18, which cause most of the HPV associated cancer cases. Gardasil also protects against HPV types 6 and 11, which cause 90% of genital warts.






Gardasil is also effective in males, providing protection against genital warts, anal cancer, and some potentially precancerous lesions caused by some HPV types. An ongoing study of males demonstrated the efficacy of Gardasil in males who did not have HPV infection prior to vaccination. The vaccination is expected to protect against penile cancer and anal cancer caused by included HPV types, and research in this area is ongoing. The HPV genome (dsDNA of ~8000 base pairs) is composed of six early (E1, E2, E3, E4, E6, and E7) and two late (L1 and L2) proteins. After the host cell is infected E1 and E2 are expressed first. In the upper layers of the host epithelium, the late genes L1 and L2 are transcribed/translated and serve as structural proteins that encapsidate the amplified viral genomes. The papillomavirus capsid also contains a viral protein known as L2, which is less abundant. L2 is of interest as a possible target for more broadly protective HPV vaccines. HPV06 L1 (protein accession #CAU03682.1, 501-aa), HPV11 L1 (protein accession #CCB84764, 503-aa)) HPV16 L1 (protein accession #ACA14209; 531aa/505-aa), HPV18 L1 (protein accession #AAP20601; 568-aa/427-aa).

Gardasil contains recombinant VLPs assembled from the L1 proteins of HPV types 6, 11, 16 and 18. Since VLPs lack the viral DNA, they cannot induce cancer. They do, however, trigger an antibody response that protects vaccine recipients from becoming infected with the HPV types represented in the vaccine. The L1 proteins are produced by separate fermentations in recombinant S. cerevisiae and self-assembled into VLPs.

ADI has cloned, expressed, and purified HPV L1s from HPV6, HPV11, HPV16, and HPV18 viruses. Specific antibody ELISA kits have been developed to test the efficacy of existing (Gardasil/Cervarix) or new HPV vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### Human papilloma virus vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2735

| ELISA Kit Description | Species | IgG Specifc Cat# | IgM Specifc Cat# |
|---|---|---|---|
| HPV Vaccine (**Gardasil/Cervarix**) **HPV6L1** antibody ELISA kit | Human | 550-106-PHG | |
| | Mouse | 550-306-PMG | |
| | Rabbit | 550-206-PRG | |
| HPV Vaccine (Gardasil/Cervarix) HPV11L1 antibody ELISA kit | Human | 550-111-PHG | |
| | Mouse | 550-311-PMG | |
| | Rabbit | 550-211-PRG | |
| HPV Vaccine (**Gardasil/Cervarix**) **HPV16L1** antibody ELISA kit | Human | 550-116-PHG | |
| | Mouse | 550-316-PMG | |
| | Rabbit | 550-216-PRG | |
| HPV Vaccine (**Gardasil/Cervarix**) **HPV18L1** antibody ELISA kit | Human | 550-118-PHG | |
| | Mouse | 550-318-PMG | |
| | Rabbit | 550-218-PRG | |



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## Human Papilloma Virus (HPV) Vaccine: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2735

| Items | Catalog# | Product Description | Product Type |
|---|---|---|---|
| HPV06 | HPV06E71-M | Monoclonal Anti-Human Papilloma Virus 6 early protein 7 (E7) (HPV6E7) IgG, | Antibodies |
| | HPV06L11-M | Monoclonal Anti-Human Papilloma Virus 6 late protein L1 (HPV6L1) IgG | Antibodies |
| | HPV06L12-S | Rabbit Anti-Human Papilloma Virus 6 late protein L1 (HPV6L1, full length) antiserum | Antibodies |
| | HPV06L15-R-10 | Recombinant (E.coli) Human Papilloma Virus 06 late protein L1 (HPV6L1), full length, His-tag | Recombinant protein |
| HPV11 | HPV11L11-M | Monoclonal Anti-Human Papilloma Virus 11 (HPV11) late protein L1 (HPV11L1) IgG, aff pure #1 | Antibodies |
| | HPV11L12-S | Rabbit Anti-Human Papilloma Virus 11 late protein L1 (HPV11L1, full length) antiserum | Antibodies |
| | HPV11L15-R-10 | Recombinant (E.coli) Human Papilloma Virus 11 late protein L1 (HPV11L1), full length, His-tag | Recombinant protein |
| HPV16 | HPV16E21-M | Monoclonal Anti-Human Papilloma Virus 16 early protein E2 (HPV16E2) IgG, aff pure #1 | Antibodies |
| | HPV16E61-M | Monoclonal Anti-Human Papilloma Virus 16 (HPV16) early protein E6 (HPV16E6) IgG, aff pure #1 | Antibodies |
| | HPV16E71-M | Monoclonal Anti-Human Papilloma Virus 16 (HPV16) early protein E7 (HPV16E7) IgG, aff pure #1 | Antibodies |
| | HPV16L12-S | Rabbit Anti-Human Papilloma Virus 16 late protein L1 (HPV16L1, full length) antiserum | Antibodies |
| | HPV16L11-M | Monoclonal Anti-Human Papilloma Virus 16 (HPV16) late protein L1 (HPV16L1) IgG, aff pure #1 | Antibodies |
| | HPV16L11-C | Recombinant purified Human Papilloma Virus 16 late protein L1 ((HPV16l1, full length) control for WB | Western Control |
| | HPV16E21-R-100 | Recombinant (E.coli) Human Papilloma Virus 16 early protein (HPV16, E2+E6+E7 epitopes fused to GST protein | Recombinant protein |
| | HPV16L15-R-10 | Recombinant (E.coli) Human Papilloma Virus 16 late protein L1 protein ((HPV16L1, his-tag), full length, | Recombinant protein |
| HPV18 | HPV18E61-M | Monoclonal Anti-Human Papilloma Virus 18 early protein E6 (HPV18E6) IgG, aff pure #1 | Antibodies |
| | HPV18E71-M | Monoclonal Anti-Human Papilloma Virus 18 early protein E7 (HPV18E7) IgG, aff pure #1 | Antibodies |
| | HPV18L12-S | Rabbit Anti-Human Papilloma Virus 18 late protein L1 (HPV18L1, full length) antiserum | Antibodies |
| | HPV18L11-M | Monoclonal Anti-Human Papilloma Virus 18 late protein L1 (HPV18L1) IgG, aff pure #1 | Antibodies |
| | HPV618L13-S | Mouse Anti-Gardasil vaccine L1s (Human Papilloma Virus/HPV6+11+16+18 late proteins) antiserum control for ELISA | Antibodies |
| | HPV18L11-C | Recombinant purified Human Papilloma Virus 18 late protein L1 (HPV18L1, full length) control for WB | Western Blot +ve Control |
| | HPV18E25-R-50 | Recombinant (E.coli) Human Papilloma Virus 18 early protein (HPV18; E2+E6+E7 epitopes fused to GST protein | Recombinant protein |
| | HPV18L15-R-10 | Recombinant (E.coli) Human Papilloma Virus 18 late protein L1 (HPV18L1), full length, His-tag | Recombinant protein |
| | SP-100307-1 | HPV-E7-N (AA: Tyr-Met-Leu-Asp-Leu-Gln-Pro-Glu-Thr-Thr-Asp-Leu-Tyr-Cys-Tyr-Glu-Gln-Leu-Asn-Asp) (MW: 2467.72) | Synthetic peptide |
| | SP-100308-1 | HPV-E7-C (AA: Ser-Ser-Glu-Glu-Glu-Asp-Glu-Ile-Asp-Gly-Pro-Ala-Gly-Gln-Ala-Glu-Pro-Asp-Arg-Ala) (MW: 2102.08) | Synthetic peptide |
| | SP-100309-1 | HPV-E6-N (AA: Asp-Pro-Gln-Glu-Arg-Pro-Arg-Lys-Leu-Pro-Gln-Leu-Cys-Thr-Glu) (MW: 1810.07) | Synthetic peptide |
| | SP-100310-1 | HPV-E6-M (AA: Ser-Glu-Tyr-Pro-His-Tyr-Cys-Tyr-Ser-Leu-Tyr-Gly-Thr-Thr-Leu-Glu-Gln-Gln-Tyr-Asn) (MW: 2459.64) | Synthetic peptide |
| | SP-100311-1 | HPV-E6-C (AA: Pro-Leu-Cys-Pro-Glu-Glu-Lys-Gln-Arg-His-Leu-Asp-Lys-Lys-Gln-Arg-Phe-His-Asn-Ile) (MW: 2516.92) | Synthetic peptide |



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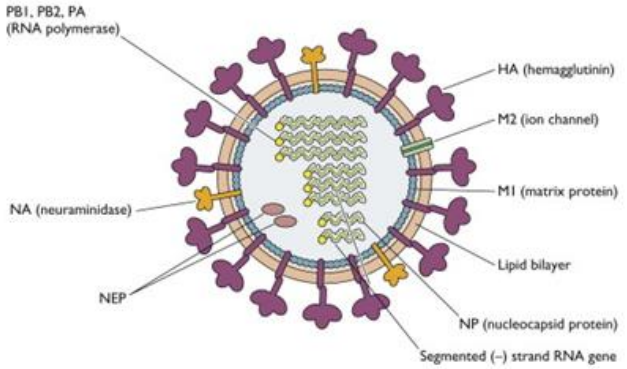
## Influenza A & B Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

**Influenza A** virus causes influenza in birds and some mammals, and is the only species of influenza virus A. Occasionally, viruses are transmitted from wild aquatic birds to domestic poultry, and this may cause an outbreak or give rise to human influenza pandemics. The physical structure of all influenza A viruses is similar. The Influenza A virus genome is contained on eight single (non-paired) RNA strands that code for eleven proteins (**HA, NA, NP, M1, M2, NS1, NEP, PA, PB1, PB1-F2, PB2**). The several subtypes are labeled according to an H number (for the type of hemagglutinin) and an N number (for the type of neuraminidase). There are 17 different H antigens (**H1 to H17**) and nine different N antigens (**N1 to N9**). Influenza A virus subtype H5N1, also known as "bird flu", A(H5N1) or simply H5N1, is a subtype of the influenza A virus which can cause illness in humans and many other animal species. It is epizootic (an epidemic in nonhumans) and panzootic (affecting animals of many species, especially over a wide area), killing tens of millions of birds and spurring the culling of hundreds of millions of others to stem its spread. Influenza viruses have a relatively high mutation rate that is characteristic of RNA viruses. The ability of various influenza strains to show species-selectivity is largely due to variation in the hemagglutinin genes that can significantly alter the ability of viral hemagglutinin proteins to bind to receptors on the surface of host cells. The influenza vaccination, also known as a **flu shot**, is an annual vaccination using a vaccine specific for a given year to protect against the highly variable influenza virus.

The annual flu (seasonal flu) in the U.S. results in approximately 36,000 deaths and more than 200,000 hospitalizations each year. In addition to this human toll, influenza is annually responsible for a total cost of over $10 billion in the U.S. The influenza virus constantly mutates, forcing scientists to play catch-up and produce a new seasonal vaccine each year. The annually updated, **trivalent influenza vaccine** consists of hemagglutinin (HA) surface glycoprotein components from influenza H3N2, H1N1, and B influenza viruses. In 20112, scientist discovered a "**super antibody (FI6)**" against the hemeagglutin protein that is common to most influenza strains. It is hoped that this protein may be a candidate to make "**universal vaccine**". In 2008 Acambis announced work on a universal flu vaccine (**ACAM-FLU-ATM**) based on the less variable M2 protein component of the flu virus shell. The Wistar Institute received a patent for using "a variety of peptides" in a flu vaccine. In 2010, NIAID of the U.S. NIH announced a breakthrough; the effort targets the stem, which mutates less often than the head of the virus. DNA vaccines such as **VGX-3400X** (aimed at multiple H5N1 strains) contain DNA fragments (plasmids). Inovios SynCon DNA vaccines include H5N1 and H1N1 subtypes. Some universal flu vaccines have started early stage clinical trials. BiondVax are targeting the less variable stalk of the **haemagglutinin molecule with Multimeric-001**. This is aimed at type A (inc H1N1) and Type B influenza and has started a phase IIa study. Dynavax have developed a **vaccine N8295** based on two highly conserved antigens NP and M2e and their TLR9 agonist, and started clinical trials in June 2010. ITS's **fp01** includes 6 peptide antigens to highly conserved segments of the PA, PB1, PB2, NP & M1 proteins, and has started phase I trials.

**Fluzone** is a split-virus vaccine that is produced by chemical disruption of the influenza virus. It is incapable of causing influenza. Fluzone Intradermal is formulated to contain HA of each of the following three influenza strains recommended for the 2012-2013 influenza season: A/California/07/2009 NYMC X-179A (H1N1), A/Victoria/361/2011 IVR-165 (H3N2) and B/Texas/6/2011 (a B/Wisconsin/1/2010-like virus). **FLUARIX** is a vaccine prepared from influenza viruses hemagglutinin (HA) in the recommended ratio of 15 mcg HA of each of the following 3 strains: A/California/7/2009 NYMC X-181 (H1N1), A/Victoria/210/2009 NYMC X-187 (H3N2) (an A/Perth/16/2009-like virus), and B/Brisbane/60/2008) propagated in embryonated chicken eggs. **FLUVIRIN**® is an inactivated influenza virus vaccine indicated for immunization of persons 4 years of age and older against influenza virus disease caused by influenza virus subtypes A and type B contained in the vaccine. **FLULAVAL** 2012/2013- influenza a virus a/california/7/2009 x-179a (h1n1) antigen, influenza a virus a/victoria/361/2011 ivr-165 (h3n2) antigen and influenza b virus b/hubei-wujiagang/158/2009 bx-39 antigen suspension.





ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### Influenza A/B Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2736

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# | Antibody Type IgA Cat# |
|---|---|---|---|---|
| Influenza A Virus Vaccine ELISA kits | Rabbit | 920-070-H1G | | |
| | Swine/Pig | 920-010-PAG | 920-020-PAM | 920-030-PAA |
| | Human | 920-040-HAG | 920-050-HAM | 920-060-HAA |
| | Chicken | 920-100-AIV | 920-105-AIM | |
| | Chicken H5N1 | 920-300-H51 | | |
| Influenza B Virus Vaccine ELISA kits | Human | 920-400-HBG | | |
| | Mouse | 920-500-MBG | | |
| | Rabbit | 920-605-RBG | 920-610-RBM | |



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## Influenza A Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

| Cat# | Description | Product Type |
|---|---|---|
| AR-232-U | H5 Avian Influenza Virus (HAS15-5), RNA Aptamer, unlabeled | RNA Aptamers |
| AR-242-U | Human Influenza A virus H3N2 (P30-10-16), RNA Aptamer, unlabeled | RNA Aptamers |
| H11N2-01-A | Anti-Hemagglutinin HA1 Influenza A Virus (H11N2; A/duck/Yangzhou/906/2002) IgG | Pure protein |
| H11N2-01-C | Recombinant Purified Hemagglutinin Influenza A Virus (H11N2; A/duck/Yangzhou/906/2002) control | Pure protein |
| H1N1-01-A | Anti-Hemagglutinin Influenza A Virus H1N1 H1 (H1N1) (A/New Caledonia/20/99) IgG | Pure protein |
| H1N1-01-C | Recombinant Purified Hemagglutinin Influenza A Virus H1N1 (A/New Caledonia/20/99) protein control | Pure protein |
| H1N1-01-R-10 | Recombinant Purified Hemagglutinin Influenza A Virus H1N1 (A/New Caledonia/20/99) protein | Pure protein |
| H1N1-02-A | Anti-Hemagglutinin Influenza A Virus H1N1 H1 (Pan H1N1 reacts with multiple strains of H1N1) IgG | Pure protein |
| H5N11-C | Recom Purified Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa) | Pure protein |
| H5N11-S | Rabbit Anti-Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa) protein | Antibodies |
| H5N12-S | Mouse Anti-Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa) protein | Antibodies |
| H5N15-R-10 | Rec. Pure Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa), His-tag | Pure protein |
| H5N15-R-100 | Rec. Purified Hemagglutinin Influenza A Virus H5N1(A/chicken/India/NIV33487/2006) (17-531aa), His-tag | Pure protein |
| HIB12-S | Rabbit Anti-Haemophilus influenzae, Type B (heat killed, whole bacteria) antiserum | Antibodies |
| INFA11-M | Mouse Anti-Influenza A virus IgG, aff pure | Antibodies |
| MA-20170 | Mouse Monoclonal Anti-Human Influenza A virus Nucleoprotein | Antibodies |
| MA-20171 | Mouse Monoclonal Anti-Human Influenza B virus Nucleoprotein | Antibodies |
| PRPB11-S | Rabbit Anti-Haemophilus influenzae, Type B PRP (Hib-PRP) antiserum | Antibodies |
| RP-1520 | Influenza A Virus (H1N1) Beijing 262/95 | Pure protein |
| RP-1521 | Influenza A Virus (H1N1) New Caledonia 20/99 IV 116 | Pure protein |
| RP-1522 | Influenza A Virus (H3N2) Shangdong 9/93 | Pure protein |
| RP-1523 | Influenza A Virus (H3N2) Kiev 301/94 like /Johannesburg 33/94 | Pure protein |
| RP-1524 | Influenza A Virus (H3N2) Panama 2007/99 | Pure protein |
| RP-1525 | Influenza A Virus (H1N1) Taiwan 1/86 | Pure protein |
| RP-1526 | Influenza B Virus Qingdao 102/91 (purified virus, inactivated) | Virus/inactivated |
| RP-1527 | Influenza B Virus Tokio 53/99 (purified virus, inactivated) | Pure protein |
| RP-1528 | Influenza B Virus Victoria 504/00 (purified 7/6/2011, inactivated) | Pure protein |
| RP-1591 | Influenza B Virus Florida 04/06 (purified virus, inactivated) | Pure protein |
| RP-1592 | Influenza B Virus Malaysia 2506/04 (purified virus, inactivated) | Inactivated Virus |
| RP-1593 | Recombinant Hemagglutinin Influenza B Virus Malaysia 2506/04 (HA full length, insect cells) | Pure protein |
| RP-638 | Recombinant Hemagglutinin Influenza A Virus H1N1 New Caledonia 20/99 (HA full length, Sf9 cells) | Pure protein |
| RP-639 | Recombinant Hemagglutinin Influenza A Virus H1N1 Texas 36/91 | Pure protein |
| RP-640 | Recombinant Hemagglutinin Influenza A Virus H7N7 Netherlands 219/03 | Pure protein |
| RP-641 | Recombinant Hemagglutinin Influenza A Virus H5N1 Vietnam 1203/04 | Pure protein |
| RP-642 | Recombinant Hemagglutinin Influenza A Virus H3N2 New York 55/04 (HA protein full length, Sf9 cells)) | Pure protein |
| RP-643 | Recombinant Hemagglutinin Influenza A Virus H3N2 Wyoming 3/03 | Pure protein |
| RP-644 | Recombinant Hemagglutinin Influenza A Virus H9N2 Hong Kong 1073/99 | Pure protein |
| RP-645 | Recombinant Hemagglutinin Influenza A Virus H1N1 California/04/2009 | Pure protein |
| RP-646 | Recombinant Hemagglutinin Influenza B Virus Ohio 01/05 (HA full length, insect cells) | Pure protein |
| RP-647 | Recombinant Hemagglutinin Influenza A Virus H3N2 Wisconsin 67/05 | Pure protein |
| RP-648 | Recombinant Hemagglutinin Influenza B Virus Jilin 20/03 (HA full length, insect cells) | Pure protein |
| SEND21-M | Monoclonal Anti-Parainfluenza virus 3 IgG | Antiserum |
| SEND22-M | Monoclonal Anti-Parainfluenza virus 2 IgG | Antiserum |
| SEND23-S | Goat Anti-Sendai (Sev/Parainfluenza virus 2/3) antiserum | Antiserum |
| SP-53126-5 | Influenza HA (307 - 319) (AA: Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr) (MW: 1503.82) | Pure Peptide |
| SP-56844-5 | Influenza HA (518 - 526) (AA: Ile-Tyr-Ser-Thr-Val-Ala-Ser-Ser-Leu) (MW: 940.07) | Pure Peptide |
| SP-58255-5 | Influenza A NP (366 - 374) Strain A/NT/60/68 (AA: Ala-Ser-Asn-Glu-Asn-Met-Asp-Ala-Met) (MW: 982.06) | Pure Peptide |
| SP-64000-5 | Influenza HA (110 - 120) (AA: Ser-Phe-Glu-Arg-Phe-Glu-Ile-Phe-Pro-Lys-Glu) (MW: 1428.62) | Pure Peptide |
| SP-64021-5 | Influenza NP (147 - 155) (AA: Thr-Tyr-Gln-Arg-Thr-Arg-Ala-Leu-Val) (MW: 1107.29) | Pure Peptide |
| SP-68060-5 | Influenza A NP (366 - 374) Strain A/PR/8/35 (AA: Ala-Ser-Asn-Glu-Asn-Met-Glu-Thr-Met) (MW: 1026.12) | Pure Peptide |
| SP-68061-5 | PA (224–233), Influenza (AA: Ser-Ser-Leu-Glu-Asn-Phe-Arg-Ala-Tyr-Val) (MW: 1185.31) | Pure Peptide |
| SP-83168-5 | NS2(114 - 121), Influenza (AA: Arg-Thr-Phe-Ser-Phe-Gln-Leu-Ile) (MW: 1011.20) | Pure Peptide |
| SP-83170-5 | PB1(703 - 711), Influenza (AA: Ser-Ser-Tyr-Arg-Arg-Pro-Val-Gly-Ile) (MW: 1034.19) | Pure Peptide |
| SP-86614-5 | Influenza NP (50 - 57) (AA: Ser-Asp-Tyr-Glu-Gly-Arg-Leu-Ile) (MW: 952.04) | Pure Peptide |
| SP-86615-5 | Influenza NP (482 - 489) (AA: Ser-Asn-Glu-Gly-Ser-Tyr-Phe-Phe) (MW: 949.98) | Pure Peptide |
| SP-86616-5 | Influenza HA (529 - 537) (AA: Ile-Tyr-Ala-Thr-Val-Ala-Gly-Ser-Leu) (MW: 894.04) | Pure Peptide |
| SP-86617-5 | Influenza HA (210 - 219) (AA: Thr-Tyr-Val-Ser-Val-Gly-Thr-Ser-Thr-Leu) (MW: 1027.15) | Pure Peptide |
| SP-86618-5 | Influenza HA (204 - 212) (AA: Leu-Tyr-Gln-Asn-Val-Gly-Thr-Tyr-Val) (MW: 1056.19) | Pure Peptide |
| SP-86619-5 | Influenza HA (110 - 119) (AA: Ser-Phe-Glu-Arg-Phe-Glu-Ile-Phe-Pro-Lys) (MW: 1299.50) | Pure Peptide |
| SP-86620-5 | Influenza A NP (366 - 374) (AA: Ala-Ser-Asn-Glu-Met-Asn-Asp-Ala-Met) (MW: 982.06) | Pure Peptide |
| SP-86621-1 | Influenza A M2 coat protein (22 - 46) | Pure Peptide |



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| | | |
|---|---|---|
| SP-88515-1 | Hemagglutinin (48-68) / Influenza virus | Pure Peptide |

Influenza_A_Flr 130207A





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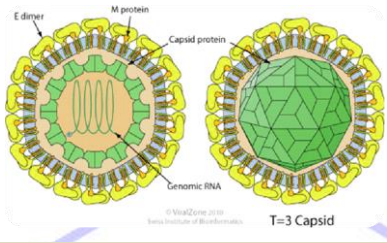
## Japanese Encephalitis Virus (JEV) Vaccines Antibody ELISA Kits, Recombinant Proteins, and Antibodies

Japanese encephalitis—previously known as Japanese B encephalitis to distinguish it from von Economo's A encephalitis—is a disease caused by the mosquito-borne Japanese encephalitis virus. The Japanese encephalitis virus is a virus from the family Flaviviridae. Domestic pigs and wild birds are reservoirs of the virus; transmission to humans may cause severe symptoms. One of the most important vectors of this disease is the mosquito Culex tritaeniorhynchus. This disease is most prevalent in Southeast Asia and the Far East. Japanese encephalitis has an incubation period of 5 to 15 days and the vast majority of infections are asymptomatic: only 1 in 250 infections develop into encephalitis. Severe rigors mark the onset of this disease in humans. Fever, headache and malaise are other non-specific symptoms of this disease which may last for a period of between 1 and 6 days. Signs which develop during the acute encephalitic stage include neck rigidity, cachexia, hemiparesis, convulsions and a raised body temperature between 38 and 41 degrees Celsius. Mental retardation developed from this disease usually leads to coma. Mortality of this disease varies but is generally much higher in children. The causative agent Japanese encephalitis virus is an enveloped virus of the genus flavivirus; it is closely related to the West Nile virus and St. Louis encephalitis virus. Positive sense single stranded RNA genome is packaged in the capsid, formed by the capsid protein. The outer envelope is formed by envelope (E) protein and is the protective antigen. Japanese Encephalitis is diagnosed by detection of antibodies in serum and CSF (cerebrospinal fluid) by ELISA.






The causative agent Japanese encephalitis virus is an enveloped virus of the genus flavivirus and is closely related to the West Nile virus and St. Louis encephalitis virus. The positive sense single stranded RNA genome is packaged in the capsid which is formed by the capsid protein. The outer envelope is formed by envelope (E) protein and is the protective antigen. It aids in entry of the virus to the inside of the cell. The genome also encodes several nonstructural proteins also (NS1,NS2a,NS2b,NS3,N4a,NS4b,NS5). NS1 is produced as secretory form also. NS3 is a putative helicase, and NS5 is the viral polymerase. It has been noted that the Japanese encephalitis virus (JEV) infects the lumen of the endoplasmic reticulum (ER) and rapidly accumulates substantial amounts of viral proteins for the JEV. Japanese Encephalitis is diagnosed by detection of antibodies in serum and CSF (cerebrospinal fluid) by IgM capture ELISA. Viral antigen can also be shown in tissues by indirect fluorescent antibody staining.

Infection with JEV confers life-long immunity. All current vaccines are based on the genotype III virus. Two kinds of JEV vaccines were made available. One of them was an inactivated mouse brain-derived vaccine (the Nakayama and/or Beijing-1 strain), made by BIKEN and marketed by Sanofi Pasteur as JE-VAX, until production ceased in 2005. The other was an inactivated vaccine cultivated on primary hamster kidney cells (the Beijing-3 strain). The Beijing-3 strain was the main variant of the vaccine used in the People's Republic of China from 1968 until 2005. Three **second-generation vaccines** have entered markets since then: SA14-14-2, IC51 and ChimeriVax-JE. The live-attenuated SA14-14-2 strain was introduced in China in 1988. It is much cheaper than alternative vaccines, and is administered to 20 million Chinese children each year. A purified, formalin-inactivated, whole virus vaccine known as IC51 (marketed in Australia and New Zealand as JESPECT and elsewhere as **IXIARO**) was licensed for use in the United States, Australia, and Europe during the spring of 2009. It is based on a SA14-14-2 strain and cultivated in Vero cells. Another vaccine, a live-attenuated yellow fever-Japanese encephalitis chimeric vaccine known as **ChimeriVax-JE** (marketed as **IMOJEV**) was licensed for use in Australia in August 2010. China licensed a live attenuated vaccine in 1988 and more than 200 million doses have been given; this vaccine is available in Nepal, Sri Lanka, South Korea and India. There is also a new chimeric vaccine based on the yellow fever 17D vaccine that is currently under development. Recombinant envelop protein-based vaccines are also being developed.

ADI's JEV vaccine ELISA utilizes highly purified recombinant JEV virus glycoprotein as the antigen to capture anti-JEV Ig's. This kit is designed to detect anti-JEV Ig's (IgG, IgM or other isotypes). It remains to be determined if any of the current JEV vaccines induced antibodies to the JEV glycoprotein paving the way to produce new generation of recombinant vaccines. These kits will also help determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### JEV Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

| Items Description | Species | Antibody Type Ig's (G+A+M) Cat# | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|---|
| **JEV Vaccine** (Nucleoprotein) Antibody ELISA kits | Human | | 910-160-JEM | 910-170-JEM |
| | Mouse | 910-100-JEM | 910-120-JEM | 540-120-JEM |
| | Rabbit | | 910-140-JEM | 910-150-JEM |

### JEV Vaccine Related Antibodies kits

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| JEV proteins and antibodies | JEV15-R-10 | Recombinant Japanese Encephalitis Virus (JEV) envelop protein E (full length) | Pure protein |
| | RP-1435 | Recombinant Japanese Encephalitis Virus (JEV) gE immunodominant regions | Pure protein |

JEV_Vaccine_Flr 130207A

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# Keyhole Limpet Hemocyanin (KLH) Vaccine Antibody ELISA Kits

Keyhole limpet hemocyanin (KLH) is a large, multisubunit, oxygen-carrying, metalloprotein found in the hemolymph of the giant keyhole limpet, Megathura crenulata, that lives off the coast of California from Monterey Bay to Isla Asuncion off Baja California. Keyhole limpet hemocyanin is an extremely large, heterogeneous glycosylated protein consisting of subunits with a molecular weight of 350,000 and 390,000 in aggregates with molecular weights of 4,500,000-13,000,000. Each domain of a KLH subunit contains two copper atoms that together bind a single oxygen molecule (O2). The KLH protein is potently immunogenic yet safe in humans and is therefore highly prized as a vaccine carrier protein. Keyhole limpet hemocyanin (KLH) is used extensively as a carrier protein in the production of antibodies for research, biotechnology and therapeutic applications. Haptens are substances with a low molecular weight such as peptides, small proteins and drug molecules that are generally not immunogenic and require the aid of a carrier protein to stimulate a response from the immune system in the form of antibody production. KLH is the most widely employed carrier proteins for this purpose.

KLH is being tested as a therapeutic vaccine for a variety of cancers, including non-Hodgkins lymphoma, cutaneous melanoma, breast and bladder cancer. These vaccines use specific tumor-associated antigens (Haptens) conjugated to KLH to stimulate the body's immune system to generate anti-tumor immune responses which can destroy tumor cells. The KLH carrier protein is responsible for conferring immunogenicity to the tumor antigens in these vaccines. The rapidly growing interest in therapeutic vaccines (i.e. active immunotherapies) for cancer and the documented efficacy of KLH as a superior carrier protein for cancer vaccines are creating a significant biopharmaceutical market for KLH formulations. Highly purified, clinical grade preparations of KLH, vacmune or immunothel, have been made available by Biosyncorp.

The **innate immune system**, also known as non-specific immune system and first line of defense, comprises the cells and mechanisms that defend the host from infection by other organisms in a non-specific manner. This means that the cells of the innate system recognize and respond to pathogens in a generic way, but unlike the adaptive immune system, it does not confer long-lasting or protective immunity to the host. Innate immune systems provide immediate defense against infection, and are found in all classes of plant and animal life. The basal level of ant-KLH IgG and IgM differs under normal and disease conditions.

The major functions of the vertebrate innate immune system include:

- Recruiting immune cells to sites of infection, through the production of chemical factors, including specialized chemical mediators, called cytokines.
- Activation of the complement cascade to identify bacteria, activate cells and to promote clearance of dead cells or antibody complexes.
- The identification and removal of foreign substances present in organs, tissues, the blood and lymph, by specialised white blood cells.
- Activation of the adaptive immune system through a process known as antigen presentation.
- Acting as a physical and chemical barrier to infectious agents.

KLH is also used as model antigen to investigate the effect of adjuvants or to test the integrity of the immune functions. ADI has developed ELISA kits to accurately measure the antibody to KLH (IgG and IgM) or Vacmune/Immucothel (manufactured by Biosyn for clinical applications) in various animals, monkey and human samples. These kits will help assess the efficacy of antigen-KLH conjugate, dose response, effects of adjuvant and overall efficacy of a given vaccine

## KLH vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2743

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# | Antibody Type IgA Cat# |
|---|---|---|---|---|
| **KLH Vaccine** (antibody) ELISA kits | Human | 700-140-KLG | 700-145-KLM | |
| | Mouse | 700-130-KLM | | |
| | Rabbit | 700-110-KLR | | |
| | Goat | 700-100-KLG | | |
| | Chicken | 700-120-KLC | | |
| | Monkey | 700-170-KLG | 700-180-KLM | |
| | Canine | 700-195-KLG | 700-190-KLM | |

## KLH vaccine Related Antibodies and Reagentes kits

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| KLH protein and antibodies | KLH11-G | Keyhole Limpet Hemocyanin (KLH)-Agarose affinity gel for removing KLH antibodies | Aff support |
| | KLH12-M | Monoclonal Anti-KLH (keyhole leimpet hemocyanin) Ascites | Antibodies |
| | KLH13-S | Goat Anti-KLH (keyhole limpet hemocyanin) antiserum #3 | Antiserum |
| | KLH14-S | Rabbit Anti-KLH (keyhole limpet hemocyanin) antiserum #4 | Antiserum |
| | KLH15-S | Chicken Anti-KLH (keyhole limpet hemocyanin) antiserum #5 | Antiserum |



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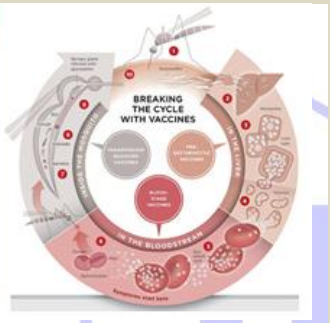
## Malaria Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

**Malaria** is a parasitic disease spread by mosquitoes. It affects about ~500 millions of people worldwide and killing an estimated 1 million annually. Over the last 50 years, vaccines for many debilitating diseases such as Diphtheria, Tetanus, Pertussis, Polio, Rabies, Mumps, Rubella, Tuberculosis, Hepatitis and Meningitis etc have been developed that are saving millions of lives worldwide. Despite many decades of research, an effective Malaria vaccine has remained elusive. The causative agent, the parasitic protozoan Plasmodium, is transmitted by mosquitoes. Four Plasmodium species infect humans. These are Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale and Plasmodium malariae. Plasmodium berghei infects rodents. P. falciparum is the most widespread and also the most serious and potentially fatal form. The life cycle of the malaria is complex, with phases both in human host and the insect vector, the female anopheline mosquito. There are several Plasmodium forms: sporozoites, merozoites, gametocytes, gamets, ookinets, oocysts. Parasite may encode in the order of 2000 proteins, several hundred of which are antigenic. Proteins synthesized by each stage may be specific to that stage, such as liver stage-specific antigen (LSA-1), or be common to several stages, such as ring-infected erythrocyte surface antigen (RESA). The malaria parasite develops through several phases in the human body that evoke different immunologic responses, and vaccines for all phases are under development. The best-characterized protein of sporozoites is circumsporozoite protein-1 (CSP-1), an approximate 60 kDa protein located on the surface of developing and mature sporozoites and present in developing exoerythrocytic forms. It constitutes the major surface protein of the sporozoite. The central domain of CSP-1 is composed of an extensive array of tandemly repeated short sequences (NANP)n and (NVDP)n.




**RTS,S** is the most clinically advanced **malaria vaccine** candidate in the world today. It targets the pre-erythrocytic stage of the disease. RTS,S vaccine aims to induce antibodies to a parasitic protein (CSP-1) that is expressed in pre-eryhtrocytic stage and therefore prevent the parasite from infecting, maturing, and multiplying in the liver, and from re-entering the bloodstream and infecting red blood cells. RTS,S consists of two polypeptides that spontaneously form composite particulate structures on their simultaneous synthesis in yeast (Saccharomyces cerevisiae). RTS is a single polypeptide chain corresponding to **CSP-1 amino acids 207-395** of P. falciparum (3D7) that is **fused to HBsAg** (adw serotype). S is a polypeptide of 226 amino acids that corresponds to HBsAg. The particles were purified from yeast-cell cultures and constitute the antigen used in the formulations. RTS,S is being developed by PATH, GlaxoSmithKline and the Bill and Melinda Gates Foundation. The addition of GSK's proprietary Adjuvant Systems (**AS01/AS02/QS21/Mpla** etc) aims to further improve the immune response. In October 2011, Phase III trial of RTS,S reported that it may protect approximately 50% of inoculated infants and children in malaria-endemic areas against infection and clinical disease caused by Plasmodium falciparum. No severe adverse events observed following the RTS,S vaccination were judged to be related to vaccination, though minor adverse events like headache, swelling, and malaise were. Antibodies to the Plasmodium falciparum circumsporozoite repeat region were measured by ELISA using a recombinant antigen R32LR that contains the sequence [**NVDP(NANP)15]2LR**. Antibodies to HBsAg were also measured by ELISA. Antibodies to the CSP-1 protein are protective in animals, and in studies of infection in challenge models. Field trials show a relation between anti-CSP-1 antibody titres and re-infection rates after curative treatment with anti-malarials. However, no association between anti-circumsporozoite antibody titres and clinical malaria has been identified.

The primary objectives of a vaccine are to produce antibodies that will neutralize the causative agent. Therefore, it is extremely important to have simple, reliable, cost-effective methods to quantify not only the antibody titers but also the isotypes of antibodies and then correlate them with disease progression and vaccine efficacy. The main component of **RTS,S malaria vaccine** is the recombinant protein sequence encoded by CSP-1 protein (amino acids 207-395 of P. falciparum (3D7) that is fused to 226-aa HBsAg proteins). HBsAg not only serve as carrier protein for CSP-1 but there is added benefit of inducing antibodies to HBsAg and protection from hepatitis B. A review of the Phase II clinical data on the antigenicity of the RTS,S vaccine reveals that anti-CSP-1 antibodies were measured using an antigen, **R32LR** (recombinant or synthetic peptides containing (NANP)15 or (NANP)30-(NVDP)4-LR or about 65-130 peptide. This antigen is not the full-length CSP-1 that was actually used in the vaccine. The assumption made was that R32LR antigens detected antibodies from malaria samples or vaccinated animals. However, R32LR antigen is not a substitute for an extended protein used in the vaccine and the R32LR-antigen based ELISA may miss antibodies that will be directed against the epitopes not present in R32LR. The truncated antigen (R32LR) will also assume a different conformation or structure than the full length CSP-1 protein in the vaccine. It is strongly advisable to use full length CSP-1 protein that was actually used in the vaccine for antibody ELISA and to draw conclusions about the RTS,S antigenicity, malaria progression, and ultimately vaccine efficacy.

ADI is the first company to develop an antibody ELISA to determine the efficacy of the RTS,S vaccine. ADI's RTS,S antibody ELISAs (mouse, rabbit, and human) use the recombinant P. falciparum CSP-1 protein (207-395aa) that is the most critical and an active component of the RTS,S vaccine. ADI is further expanding the RTS,S antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### Malaria Related Reagents and ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| **RTS,S Malaria Vaccine** (CSP-Antibody, *P. falciparum*) ELISA Kits | Mouse | 970-300-MMG | 970-310-MMM |
| | Rabbit | 970-200-CSR | 970-210-CSM |
| | Human | 970-400-CHG | 970-410-CHM |
| **MSP, Malaria Vaccine** (MSP-1 Antibody, P. falciparum) ELISA Kits | Mouse | 970-320-MSG | 970-330-MSM |
| | Rabbit | 970-340-RMG | 970-350-RMM |
| | Human | 970-360-HMG | 970-370-HMM |

**Note**: ADI also developed antibody ELISA kits using (NANP)n and (NVDP)n synthetic peptides.



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## Malaria Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2721

| Item | Catalog# | ProdDescription | ProductType |
|---|---|---|---|
| CSP Protein and peptides | CSPF11-S | Rabbit Anti-Circumsporozoite (CSP, P.falciparum) C-terminal (207-397 aa) protein antiserum | Antibodies |
| | CSPF15-P | YLKKIKNSL, P. falciparum circumsporozoite (CSP) peptide (CSP334–342) | Peptides pure |
| | CSPF15-R | Recombinant (E. coli, full length, CSP antigen (P. falciparum) | Recomb. Protein |
| | CSPF16-R | Recombinant CSP mosaic protein (107-129, 334-351 aa) P.falciparum) purified | Recomb. Protein |
| | CSPF17-R-10 | Recombinant (E. coli), purified, Circumsporozoite (CSP) (207-397 aa) P.falciparum) Protein | Recomb. Protein |
| | CSPV11-M | Mouse Anti-Circumsporozoite (CSP) (P. vivax) IgG, aff pure #1 | Antibodies |
| | CSPV16-R | Recombinant (E. coli) CSP; 353-aa and GST) antigen (P. vivax) | Recomb. Protein |
| | CSPY11-P | KIYNRNIVNRLLGD, P. yoelii circumsporozoite, PyCSP (57–70) peptide | Peptides pure |
| | CSPY12-P | SYVPSAEQI,P. yoelii circumsporozoite, PyCSP (280–288) peptide | Peptides pure |
| | DRAA31-A | Rabbit Anti-(DRAAGQPAG)3 peptide (repeat-sequence peptide of the P. vivax circumsporozoite protein, CSP) IgG, aff pure | Antibodies |
| | DRAA31-BSA | (DRAAGQPAG)3 peptide (repeat-sequence of the P. vivax CSP) conjugated with BSA | Conj. Peptides |
| | DRAA31-P | (DRAAGQPAG)3 (repeat-sequence P. vivax CSP) control/blocking peptide | Peptides pure |
| | DRAD31-P | (DRADGQPAG)3 peptide (repeat-sequence peptide of the P. vivax CSP protein, pure | Peptides pure |
| | RP-650 | Recombinant Malaria Cs Mosaic | Pure protein |
| Hemoglobin (hb) | HBG25-P | DABCYL-GABA-ERMFLSFP-EDANS, Hb, 3037a, Malaria FRET Substrate II | Substrates |
| | HBG31-P | DABCYL-GABA-ALERMFLSFP-EDANS, Hb, 2837a, Malaria FRET Substrate III | Substrates |
| HRP | HRPF21-M | Mouse Anti-Histidine rich glycoprotein II (HRP II, P. falciparum) IgG, aff pure #1 | Antibodies |
| | HRPF22-M | Mouse Anti-Histidine rich glycoprotein II (HRP II, P. falciparum) IgM, aff pure | Antibodies |
| | HRPF25-R | Recombinant (E. coli) Histidine rich glycoprotein II (HRP II, P. falciparum) | Recomb. Protein |
| LSA | LSPF31-P | LEESQVNDDIFNSLVKSVQQEQQHNV, P. falciparum Liver-Stage Antigen 3-NRII, LSA3-NRII (81-106) peptide | Peptides pure |
| | LSPF32-P | DELFNELLNSVDVNGENILEESQ, P. falciparum Liver-Stage Antigen 3-NRI peptide | Peptides pure |
| MAP | MAPF15-P | DABCYL-ERNleFLSFP-EDANS, Malaria Aspartyl Proteinase FRET (Fluorescence Resonance Energy Transfer) Substrate I | Substrates |
| | MAPF15-P-5 | DABCYL-ERNleFLSFP-EDANS, Malaria Aspartyl Proteinase FRET Substrate I | Substrates |
| Malaria Parasite | MFV11-M | Mouse Anti-Malaria (clone 1); reacts to P.vivax/falciparum | Antibodies |
| MSP-1 | MSPF11-M | Mouse Anti-Merozoite surface protein-1 (MSP-1; P. falciparum) IgG, aff pure #1 | Antibodies |
| | MSPF11-P | VTHESYQELVKKLEALEDAV, MSP-1 P1, peptide of P. falciparum | Peptides pure |
| | MSPF12-P | GYRKPLDNIKDNVGKMEDYIKK, MSP-1 P2, peptide of P. falciparum | Peptides pure |
| | MSPF131P | KLNSLNNPHNVLQNFSVFFNK, MSP-1 P3, peptide of P. falciparum | Peptides pure |
| | MSPF15-R | Recombinant (E. coli) merozoite surface protein-1 (MSP-1; P. falciparum) | Recomb. Protein |
| | MSPF25-R | Recombinant (E. coli) merozoite surface protein-2 (MSP-2; P. falciparum) | Recomb. Protein |
| | MSPV11-P | LEYYLREKAKMAGTLIIPES, P. vivax PvMSP-1 peptide 19 (378-397) | Peptides pure |
| | MSPV12-P | SKDQIKKLTSLKNKLERRQN, P. vivax PvMSP-1 peptide 53 (1058-1077) | Peptides pure |
| | MSPV13-P | NFVGKFLELQIPGHTDLLHL, P. vivax PvMSP-1 peptide 4 (78-97) | Peptides pure |
| | MSPV14-M | Mouse Anti-Merozoite surface protein-1 (MSP-1; P. vivax) IgG, aff pure #1 | Antibodies |
| | MSPV14-P | FNQLMHVINFHYDLLRANVH, P. vivax PvMSP-1 peptide 6 (118-137) | Peptides pure |
| | MSPV15-M | Mouse Anti-Merozoite surface protein-1 (MSP-1; P. vivax) IgG, aff pure #2 | Antibodies |
| | MSPV15-P | LDMLKKVVLGLWKPLDNIKD, P. vivax PvMSP-1 peptide 8 (158-177) | Peptides pure |
| | MSPV16-R | Recombinant (E. coli) merozoite surface protein-1 (MSP-1; 108-aa; P. vivax) | Recomb. Protein |
| | MSPV26-R | Recombinant (E. coli) merozoite surface protein-2 (MSP-2; 460-aa; P. vivax) | Recomb. Protein |
| (NANP)n peptides | NANP101-P | (NANP)10 (40-aa NANP repeat-sequence peptide of the P. falciparum CSP | Peptides pure |
| | NANP51-A | Rabbit Anti-(NANP)5 peptide (CSP repeat, P. falciparum) IgG, aff pure | Antibodies |
| | NANP51-BSA | (NANP)5 peptide (CSP repeat, P. falciparum) conjugated with BSA | Conj. Peptides |
| | NANP51-P | (NANP)5 peptide control/blocking peptide | Peptides pure |
| (NVDP)n Peptides | NVDP41-A | Rabbit Anti-(NVDP)4 peptide (minor CSP repeat-sequence P. falciparum IgG, aff pure | Antibodies |
| | NVDP41-BSA | (NVDP)4 peptide (CSP repeat- P. falciparum conjugated with BSA | Conj. Peptides |
| | NVDP41-P | (NVDP)4 peptide (CSP repeat-sequence P. falciparum control/blocking peptide | Peptides pure |
| (PAPP)n Peptides | PAPP311-P | (PAPPNAAND)3 peptide (repeat-sequence peptide of the P. berghei circumsporozoite protein, CSP), pure | Peptides pure |
| pLDH | PLDH11-M | Mouse Anti-parasite specific lactate dehydrogenase (pLDH), (PAN PLDH) IgG | Antibodies |
| | PLDH14-M | Mouse Anti-parasite pLDH, (P. ovale specific) IgG | Antibodies |
| | PLDH22-M | Mouse Anti-pLDH (P. falciparum specific) IgG | Antibodies |
| | PLDH31-M | Mouse Anti- pLDH (P. vivax specific) IgG | Antibodies |
| (PPPPNAAND)n | PPPP312-P | (PPPPNPPND)3 peptide (repeat-sequence of P. berghei CSP | Peptides pure |
| | PPPP321-A | Rabbit Anti-(PPPPNAAND)3 peptide (repeat-sequence P. berghei CSP) IgG, aff pure | Antibodies |
| | PPPP321-BSA | (PPPPNAAND)3 peptide (repeat-sequence P. berghei CSP) conjugated with BSA | Conj. eptides |
| | PPPP321-P | (PPPPNAAND)3 peptide (repeat-sequence P. berghei CSP) blocking peptide | Peptides pure |
| RESAF15-R | RESAF15-R | Recombinant Ring-infected erythrocyte surface antigen (RESA) (P.falciparum) | Recomb. Protein |
| HSP | RP-649 | Recombinant Malaria Protein Heat Shock protein (HSP) | Pure protein |
| Sag | SAGF11-M | Mouse Anti-S Antigen (Sag) (P. falciparum) IgG, aff pure #1 | Antibodies |
| | SAGF12-M | Mouse Anti-S Antigen (Sag) (P. falciparum) IgG, aff pure #2 | Antibodies |
| SERA | SERA15-R | Recombinant (E. coli) Serine-repeat antigen (SERA) P.falciparum | Recomb. Protein |
| MSP | SP-88357-1 | MSP-1 (20 - 39), Merozoite Surface Peptide 1 (AA:Val-Thr-His-Glu-Ser-Tyr-Gln-Glu-Leu-Val-Lys-Lys-Leu-Glu-Ala-Leu-Glu-Asp-Ala-Val) (MW: 2301.60) | Pure Peptide |
| | SP-88358-1 | MSP-1 P2, Malaria Merozoite Surface Peptide – 1 (AA: Gly-Tyr-Arg-Lys-Pro-Leu-Asp-Asn-Ile-Lys-Asp-Asn-Val-Gly-Lys-Met-Glu-Asp-Tyr-Ile-Lys-Lys) (MW: 2625.07) | Pure Peptide |



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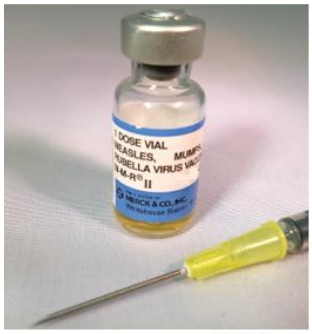
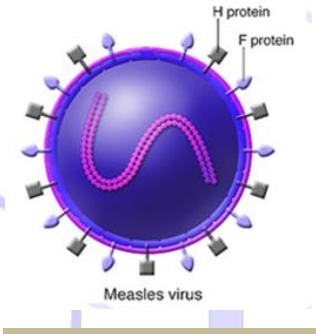
## Measles Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

**Measles**, also known as **Rubeola** or **German measles** (not to be confused with rubella, a different disease) or Morbilli, is an infection of the respiratory system caused by a virus, specifically a paramyxovirus of the genus Morbillivirus. Morbilliviruses, like other paramyxoviruses, are enveloped, single-stranded, negative-sense RNA viruses. Symptoms include fever, cough, runny nose, red eyes and a generalized, maculopapular, and erythematous rash. Measles is spread through respiration and is highly contagious—90% of people without immunity sharing living space with an infected person will catch it. The infection has an average incubation period of 14 days (range 6–19 days) and infectivity lasts from 2–4 days prior, until 2–5 days following the onset of the rash (i.e. 4–9 days infectivity).

Laboratory diagnosis of measles can be done with confirmation of positive measles IgM antibodies or isolation of measles virus RNA from respiratory specimens. The contact with any infected person in any way, including semen through sex, saliva, or mucus can cause infection. In developed countries, most children are immunized against measles by the age of 18 months, generally as part of a three-part MMR vaccine (measles, mumps, and rubella). In developing countries where measles is highly endemic, the WHO recommend that two doses of vaccine be given at six months and at nine months of age. **MMR II vaccine** (Merck) is a live virus vaccine for vaccination against measles (rubeola), mumps, and rubella (German measles). Attenuated Measle virus, derived from Enders' attenuated Edmonston strain and propagated in chick embryo cell culture, is used in MMRII vaccine. MMR II is supplied freeze-dried (lyophilized) and contains live viruses. The vaccine is a mixture of three live attenuated viruses, administered via injection. The vaccine is sold by Merck as M-M-R II, GlaxoSmithKline Biologicals as Priorix, Serum Institute of India as Tresivac, and Sanofi Pasteur as Trimovax. The component viral strains of MMR vaccine were developed by propagation in animal and human cells. The live viruses require animal or human cells as a host for production of more virus. For example, in the case of mumps and measles viruses, the virus strains were grown in embryonated hens' eggs and chick embryo cell cultures. This produced strains of virus which were adapted for the hens egg and less well-suited for human cells. These strains are therefore called attenuated strains. They are sometimes referred to as neuroattenuated because these strains are less virulent to human neurons than the wild strains. The Rubella component, Meruvax, is propagated using a human cell line (WI-38, named for the Wistar Institute) derived in 1961 from embryonic lung tissue. The MMRV vaccine, a combined measles, mumps, rubella and varicella vaccine, has been proposed as a replacement for the MMR vaccine to simplify administration of the vaccines.






ADI has developed antibody ELISA kits to determine the efficacy of various existing Measles vaccines or test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### Measles vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2748

| ELISA Kit Description | Species | IgA Specific Cat# | IgG Specific Cat# | IgM Specific Cat# |
|---|---|---|---|---|
| **Measles Vaccine** antibody ELISA kits | Human | 530-120-HMA | 530-100-HMG | 530-110-HMM |
| | Mouse | 530-150-MMA | 530-130-MMG | 530-140-MMG |

### Measles Related Antibodies, Peptides, and Recombinant Proteins Ordering Information

| Items | Catalog# | Product Description | Product Type |
|---|---|---|---|
| **Measles Virus** | MESL11-A | Monoclonal Anti-Measles (Rubeola/Edmonston strain) Virus IgG | Antibodies |
| | MESL11-A | Rabbit Anti-Measles (Rubeola/Edmonston strain) Virus IgG | Antibodies |
| | MESL15-N-500 | Measles (Rubeola) Virus (Edmonston) proteins/antigen extract | Pure protein |
| **Measles Agglutinin** | RP-1609 | Recombinant (E. Coli) purified Measles virus hemagglutinin immunodominant mosaic (106-114+519-550) protein | Pure protein |
| | RP-1610 | Recombinant (E. Coli) purified Measles virus hemagglutinin immunodominant region (399-525) protein | Pure protein |
| **Measles Agglutinin** | RP-1611 | Recombinant (E. Coli) purified Measles virus nucleocapsid protein (89-165) | Pure protein |
| | RP-655 | Recombinant Measles Virus Hemagglutinin Mosaic (1-30,115-150,379-410) | Pure protein |
| **Measles polymerase** | RP-1612 | Recombinant (E. Coli) purified Measles virus Large Polymerase (2059-2183) | Pure protein |
| | RP-1613 | Recombinant (E. Coli) purified Measles virus Large Polymerase (58-149) | Pure protein |
| | RP-651 | Recombinant Measles Virus Large Polymerase (58-149) | Pure protein |
| | RP-653 | Recombinant Measles Virus Large Polymerase (2059-2183) | Pure protein |
| **Nonstructural protein** | RP-1614 | Recombinant (E. Coli) purified Measles virus Non-Structural C-Protein (1-51aa) | Pure protein |
| | RP-652 | Recombinant Measles Virus Non-Structural C-Protein (1-51) | Pure protein |



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## Meningitis Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

**Meningococcal meningitis**, a form of meningococcal disease, is a serious bacterial infection. Unlike viral meningitis, it can potentially kill an otherwise healthy young person within a few days after the first symptoms appear. Meningitis is inflammation of the protective membranes covering the brain and spinal cord, known collectively as the meninges. The inflammation may be caused by infection with viruses, bacteria, or other microorganisms, and less commonly by certain drugs. Meningitis can be life-threatening because of the inflammation's proximity to the brain and spinal cord; therefore the condition is classified as a medical emergency.

MenVeo (Novartis)

Menactra (Sanofi)

Meningitis Bacterial immunogenic polysaccharides (Red color) are used as vaccine or after conjugating it with Diphtheria Toxoid or its mutant CRM197.

**Meningococcal vaccine** is a vaccine used against Meningococcus, a bacterium that causes meningitis, meningococcemia, septicemia, and rarely carditis, septic arthritis, or pneumonia. Neisseria meningitidis has 13 clinically significant serogroups. These are classified according to the antigenic structure of their polysaccharide capsule. **Six serogroups, A, B, C, Y, W135 and X** are responsible for virtually all cases of the disease in humans. There are currently three vaccines available in the US to prevent meningococcal disease, all quadrivalent in nature, targeting serogroups A, C, W-135 and Y: **Two conjugate vaccines** (MCV-4), **Menactra** (Polysaccharides conjugated to Diphtheria Toxoid) and **Menveo** (Conjugated to toxoid diphtheria mutant CRM197); **One polysaccharide vaccine (MPSV-4), Menomune**, produced by Sanofi Pasteur; **Mencevax** (GlaxoSmithKline, CRM197 conjugate) and NmVac4-A/C/Y/W-135 (JN-International Medical Corporation, conjugated to Diphtheria Toxoid) are used worldwide, but have not been licensed in the United States. The duration of immunity mediated by Menomune (MPSV4) is three years or less in children aged under 5 because it does not generate memory T cells. For this reason, Menomune is suitable for travelers requiring short-term protection, but not for national public health prevention programs. Menveo and Menactra contain the same antigens as Menomune, but the antigens are conjugated to a diphtheria-toxoid polysaccharide–protein complex, resulting in anticipated enhanced duration of protection, increased immunity with booster vaccinations, and effective herd immunity. Diphtheria Toxoid when conjugated to bacteria polysaccharides acts as carrier protein and adjuvant. The antibodies are produced against both the carbohydrate part and the toxoid.

ADI has developed antibody ELISA kits to determine the antibody titer against the polysaccharide as well as the toxoid. These kits will help determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### Meningitis vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2765

| Items Description | Species | IgG Specific Cat# |
|---|---|---|
| Meningitis Vaccine **Group A Oligosaccharides**-CRM197 conjugated vaccine antibody ELISA Kits | Human | 600-300-100 |
| | Mouse | 600-300-200 |
| | Rabbit | 600-310-300 |
| Meningitis Vaccine **Group CWY Oligosaccharides**-CRM197 conjugated vaccine antibody ELISA Kits | Human | 600-300-105 |
| | Mouse | 600-300-205 |
| | Rabbit | 600-320-305 |
| Meningitis Vaccine **Group ACWY Oligosaccharides**-CRM197 conjugated vaccine antibody ELISA Kits<br>Note: ADI also has separate ELISA kits to monitor antibodies to Diphtheria Toxoid. | Human | 600-300-115 |
| | Mouse | 600-310-215 |
| | Rabbit | 600-330-315 |

### Meningitis vaccine Related Antibodies and Reagents

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Anti-Meningococcal Group<br><br>Antibodies and antigens | MENA11-S | Rabbit Anti-Meningococcal **Group A** Oligosaccharides-Diphtheria CRM197 antiserum | antiserum |
| | MENA12-S | Rabbit Anti-Meningococcal **Group CWY** Oligosaccharides-Diphtheria CRM197 antiserum | antiserum |
| | MENA13-S | Rabbit Anti-Meningococcal **Group ACWY** Oligosaccharides-Diphtheria CRM197 antiserum | antiserum |
| | MENA14-F | Anti-Meningococcal **Group ABC** serotypes antigens IgG-FITC conjugate | Antibodies |
| | MENA14-HP | Anti-Meningococcal **Group ABC** serotypes antigens IgG-HRP conjugate | Antibodies |
| | MENA14-UL | Anti-Meningococcal **Group ABC** serotypes antigens IgG, Unlabeled | Antibodies |



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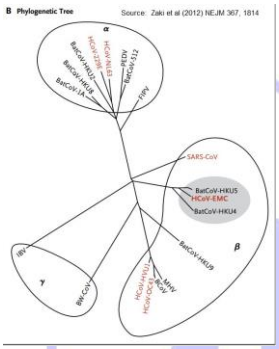
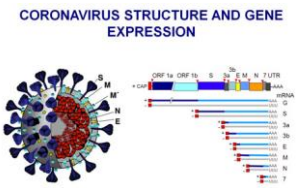
# Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Vaccine and ELISA kits

**MERS** is a viral respiratory infection caused by the newly identified MERS-coronavirus (MERS-CoV). MERS-CoV is a betacoronavirus derived from bats. Camels have been shown to have antibodies to MERS-CoV, but the exact source of infection in camels has not been identified. A strain of MERS-CoV known as HCoV-EMC/2012 found in the first patient in London in 2012 was found to have a 100% match to Egyptian tomb bats. Early reports compared the virus to severe acute respiratory syndrome (SARS), and it has been referred to as Saudi Arabia's SARS-like virus. ERS can range from asymptomatic disease to severe pneumonia leading to the acute respiratory distress syndrome. Renal failure, disseminated intravascular coagulation (DIC) and pericarditis have also been reported.



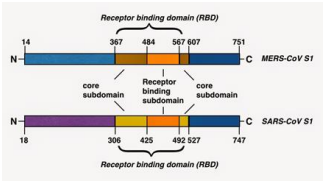

MERS have high fatality rate, 77 deaths in 187 confirmed cases. As of May 2014, MERS-CoV cases have been reported in several countries, including Saudi Arabia, Malaysia, Jordan, Qatar, Egypt, the United Arab Emirates, Tunisia, Kuwait, Oman, Algeria, Bangladesh, the Philippines (still MERS-free), Indonesia (none was confirmed), the United Kingdom, and the United States. MERS-CoV has been reported or by direct or indirect contact with others who have a travel history consistent with exposure in the Middle East. However, the origin of the infection in most cases remains unknown. Early research suggested the virus is related to one found in the bats and in dromedary camels, as 90-100% camels have antibodies to the MERS-CoV spike protein. Sera samples from European sheep, goats, cattle, and other camelids had no such antibodies. Countries like Saudi Arabia and the United Arab Emirates produce and consume large amounts of camel meat. Human or animals **diagnostic** is based upon PCR or ELISA or antibody neutralization tests. The presence of MERS viral antibodies (N, E and S) have been used to detect the infected animal or humans.




The virus MERS-CoV is a new member of the **beta group of coronavirus**, Betacoronavirus, **lineage C.** MERS-CoV genomes are phylogenetically classified into two clades, clade A and B. The earliest cases of MERS were of clade A clusters (EMC/2012 and Jordan-N3/2012), and new cases are genetically distinct (clade B). MERS-CoV is distinct from SARS and distinct from the common-cold coronavirus and known endemic human betacoronaviruses HCoV-OC43 and HCoV-HKU1. MERS-CoV is more closely related to the bat coronaviruses HKU4 and HKU5 (lineage 2C) than it is to SARS-CoV (lineage 2B), sharing more than 90% sequence identity with their closest relationships, bat coronaviruses HKU4 and HKU5.

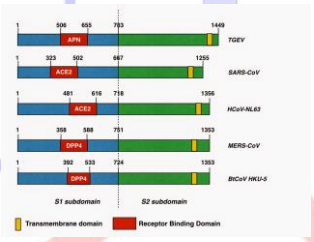
Coronaviruses are a positive ssRNA genome of about 27-32kb that codes for structural protein genes - namely the **Spike (S), Envelope (E), Membrane (M), and Nucleocapsid (N) genes and** the Polymerase. Spike (S) protein is assembled into trimers and constitute the peplomers on the surface of the viral particle that gave the Coronaviridae its name. The S protein combines two functions, binding the host receptor and membrane fusion, which are required for viral entry into the host cell. In the case of MERS-CoV, the former is attributed to the S1 subunit (AA1-751) and the latter to the S2 subunit (AA 752-1353) respectively. During viral entry, the S protein is cleaved into both subunits by host cell derived proteases.

Unlike SARS-CoV, which uses human angiotensin-converting enzyme 2 (ACE2) as its receptor for binding to ACE2-expressing




cells, MERS-CoV utilizes a different receptor, dipeptidyl peptidase 4 (**DPP4**), for binding to DPP4-expressing cells via the Spike protein. S1 subunit mediates virus binding to cells expressing DPP4 through its receptor-binding domain (RBD, 367-606 aa) region and an S2 subunit that mediates virus-cell membrane fusion. A truncated RBD domain (377-588)-Fc protein binds efficiently to DPP4.

**Serologic analysis of MERS-CoV:** Due to the conservation of MERS viral proteins (S, N, E, M) among various coronaviruses




(MERS, SARS etc) and infection of the same host and the broad distribution of CoVs in diverse mammalian species. Antibodies directed against some of the major antigens of different CoVs are known to cross-react in standard serologic assays. Potential cross-reactivity is a diagnostic challenge because camelids are known to be infected with bovine CoV (BCoV), a distinct betacoronavirus of phylogenetic lineage A unrelated to the MERS-CoV.

**MERS Vaccine and Therapeutics**: There are no approved vaccine for MERS. Inovio Pharma recently tested DNA synthetic vaccine that targets multiple MERS antigens including MERS. Novavax is testing killed virus vaccine. Nanoviricides is developing drugs that bind to viruses with virus-binding ligands in an effort to dismantle them. Antibodies to the RBD domain also protected animals from MERS infection. Therefore, MERS-CoV S1 region or the RBD are potential vaccine candidates. A nasal formulation of experimental vaccine has also shown promise. **Humanized antibodies to MERS** have shown success in animals. One of three monoclonal antibodies identified, m336, neutralized live and pseudotyped MERS-CoV with an exceptional potency of ID50 (half maximal inhibitory concentration) of 0.005 (pseudotyped MERS-CoV) and 0.07 (live MERS-CoV) µg/ml, respectively, by competing with the hDPP4 receptor.

ADI has cloned and expressed various MERS Rec. proteins and made antibodies. ADI has prepared antibody ELISA kits for whole spike protein (S1+S2), S1 domain, and the RBD-domain of S1, and the Nucleoprotein. Our preliminary data suggest that anti-S1-RBD and anti-NP antibody ELISA kits may provide the most specific analyses of MERS-Cov infection in humans and animals.

List of MERS ELISA Kits available from ADI.



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Product details, data sheets, and pricing available
(http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2795

| Items Description | Kit Type | ELISA Type IgG Cat# | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Human | Camel | Bat | Pig | Cow | Goat/sheep | Cat | Dog |
| MERS Nucleoprotein NP IgG ELISA Kit | MERS NP antibody | RV-402100-1 | RV-402110-1 | RV-402120-1 | RV-402130-1 | RV-402140-1 | RV-402150-1 | RV-402160-1 | RV-402165-1 |
| MERS Spike protein S1 IgG ELISA Kit | MERS S1 antibody | RV-402200-1 | RV-402210-1 | RV-402220-1 | RV-402230-1 | RV-402240-1 | RV-402250-1 | RV-402260-1 | RV-402265-1 |
| MERS Spike protein S2 IgG ELISA Kit | MERS S2 antibody | RV-402300-1 | RV-402310-1 | RV-402320-1 | RV-402330-1 | RV-402340-1 | RV-402350-1 | | |
| MERS S1-RBD IgG Kit | MERS RBD antibody | RV-402400-1 | RV-402410-1 | RV-402420-1 | RV-402430-1 | RV-402440-1 | RV-402450-1 | | |

Notes: All of the ELISA kits are coated with purified Rec. proteins expressed in HEK or E. coli. There is no MERS virus or viral proteins used in the kit. So there is no risk of contamination in using these kits. All ELISA kits are for in vitro research use only (RUO), not for diagnostic procedures.

List of MERS reagents available from ADI.

| | Catalog# | Product Description | Product Type |
|---|---|---|---|
| DPP/CD26 | DPP41-A | Rabbit anti-human (mouse, rat) DPP4 peptide IgG, aff pure | Antiserum |
| | DPP45-R-10 | Recom (HEK) Mouse Dipeptidyl peptidase 4 (DPP4) protein (29-760 a.a, hIgG1-Fc-tag, >95%, low Endotoxin) | Rec. Protein |
| | DPP46-R-10 | Recom (HEK) Human Dipeptidyl peptidase 4 (DPP4) protein (34-766 a.a, His-tag, >95%, low Endotoxin) | Rec. Protein |
| | DPP47-R-10 | Recom (HEK) Human DPP4 protein (29-766 a.a, hIgG-Fc-tag, >95%, low Endotoxin) | Rec. Protein |
| | DPP48-N-1 | Purified Human Placenta Dipeptidyl Peptidase IV (DPP4), active | Native Protein |
| MERS-RBD | MERS31-S | Rabbit Anti- Recom (E. Coli) MERS-CoV RBD (383-502 aa) antiserum | Antibodies |
| | MERS35-R-10 | Recombinant (Sf9) MERS-CoV RBD (367-606 a.a, Rb Fc-tag, ~51 kda, >80%, low Endotoxin), active | Rec. Protein |
| | MERS36-R-10 | Recom (E. Coli) Purified MERS RBD (383-502 aa, His-tag ~15 kda) for ELISA and Western | Rec. Protein |
| | MERS37-R-10 | Recom (Sf9) Purified MERS-CoV RBD (383-502 a.a, Rb Fc-tag, ~42 kda, >85%, low Endotoxin), active | Rec. Protein |
| | MERS38-R-10 | Recom (Sf9) Purified MERS-CoV RBD (367-606 a.a, His-tag, ~28 kda, low Endotoxin), active | Rec. Protein |
| | MERS39-R-10 | Recom (Sf9) Purified MERS-CoV RBD (383-502 a.a, Mouse Fc-tag, ~44 kda, low Endotoxin), active | Rec. Protein |
| MERS-NP | MERSNP11-M | Mouse monoclonal Anti-MERS-CoV Nucleoprotein/NP (1-413 a.a) IgG, aff pure | Antiserum |
| | MERSNP12-A | Rabbit Anti-MERS-CoV Nucleoprotein/NP (1-413 a.a) IgG | Antiserum |
| | MERSNP15-R-10 | Recom (Sf9) MERS-CoV Nucleoprotein NP (1-413 aa, His-tag, ~47 kda, low Endotoxin, >95%) | Rec. Protein |
| | MERSNP16-R-10 | Recom (E. coli) MERS-CoV Nucleoprotein NP (1-413 aa, His-tag, ~47 kda, low Endotoxin, >95%) | Rec. Protein |
| MERS-S1 | MERSS126-R-10 | Recom (Sf9) Purified MERS Spike protein ECD (1-1297 a.a, His-tag, ~157 kda, low Endotoxin) | Rec. Protein |
| | MERSS12-A | Rabbit Anti-MERS-CoV Spike protein S1 protein peptide, C-terminal IgG, aff pure | Antiserum |
| | MERSS15-R-10 | Recombinant (HEK) Purified MERS-CoV Spike protein 1 (1-725 aa, His-tag, ~94 kda, low Endotoxin, >95%) | Rec. Protein |
| | MERSS16-R-10 | Recom. (Sf9) Purified MERS-CoV Spike protein S1 (18-725 a.a, His-tag, ~94 kda, low Endotoxin), active | Rec. Protein |
| | MERSS17-R-10 | Recom. (E. coli) Purified MERS-CoV Spike protein S1 (18-524 a.a, His-tag, ~62 kda) | Rec. Protein |
| | MERS121-A | Rabbit Anti-MERS Spike protein (1-1297 a.a) IgG, aff pure | Antiserum |
| | MERS122-M | Rabbit monoclonal Anti-MERS Spike protein (S1/RBD) IgG (Neutralizing) | Antibodies |
| | MERS123-M | Mouse monoclonal Anti-MERS Spike protein (S1/18-725aa) IgG (clone 1) | |
| | MERS124-M | Mouse monoclonal Anti-MERS Spike protein (S1/18-725aa) IgG (clone 2) | |
| | MERSS41-S | Anti-MERS-CoV Spike protein S1 (18-524 aa) protein antiserum | Rec. Protein |
| | | | |
| MERS-S2 | MERSS21-M | Mouse monoclonal Anti-MERS-CoV Spike protein S2 (726-1296 a.a) IgG, aff pure | Antiserum |
| | MERSS22-A | Rabbit Anti-MERS-CoV Spike protein S2 (726-1296 a.a) IgG, aff pure | Antiserum |
| | MERSS25-R-10 | Recom (Sf9) MERS-CoV Spike Protein S2 (726-1296 a.a, His-tag, ~66 kDa, low endotoxin) purified | Rec. Protein |



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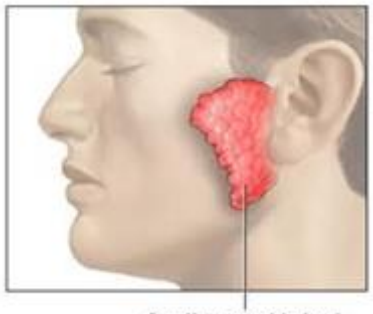


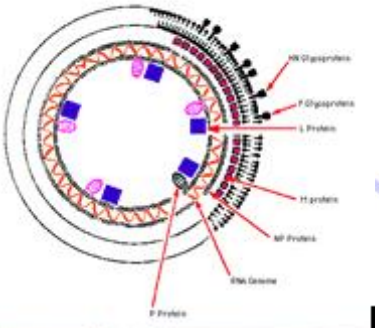


**Mumps** and epidemic parotitis is a viral disease of the human species, caused by the mumps virus. Painful swelling of the salivary glands (classically the parotid gland) is the most typical presentation. Painful testicular swelling (orchitis) and rash may also occur. The symptoms are generally not severe in children. The disease is generally self-limited, running its course before receding, with no specific treatment apart from controlling the symptoms with pain medication. Mumps is a contagious disease that is spread from person to person through contact with respiratory secretions such as saliva from an infected person. Mumps can also be spread by sharing food. A person infected with mumps is contagious from approximately 6 days before the onset of symptoms until about 9 days after symptoms start.

A physical examination confirms the presence of the swollen glands. Usually the disease is diagnosed on clinical grounds and no confirmatory laboratory testing is needed. If there is uncertainty about the diagnosis, a test of saliva or blood may be carried out; a newer diagnostic confirmation, using real-time nested polymerase chain reaction (PCR) technology, has also been developed. An estimated 20%-30% of cases are asymptomatic. As with any inflammation of the salivary glands, serum amylase is often elevated.

Before the development of vaccination and the introduction of a vaccine, it was a common childhood disease worldwide. It is still a significant threat to health in the third world, and outbreaks still occur sporadically in developed countries. The most common preventative measure against mumps is immunization with a mumps vaccine. The vaccine may be given separately or as part of the MMR immunization vaccine which also protects against measles and rubella. The efficacy of the vaccine depends on the strain of the vaccine, but is usually around 80%. The Jeryl Lynn strain is most commonly used in developed countries but has been shown to have reduced efficacy in epidemic situations. The Leningrad-Zagreb strain commonly used in developing countries appears to have superior efficacy in epidemic situations.

In developed countries, most children are immunized against measles by the age of 18 months, generally as part of a three-part **MMR vaccine** (measles, mumps, and rubella). In developing countries where measles is highly endemic, the WHO recommend that two doses of vaccine be given at six months and at nine months of age. Vaccine efficacy can be measured by the number of reported cases in the USA. For measles, 894,134 cases reported in 1941 compared to 288 cases reported in 1995 resulted in a 99.97% decrease in reported cases; for mumps, 152,209 cases reported in 1968 compared to 840 cases reported in 1995 resulted in a 99.45% decrease in reported cases; and for rubella, 57,686 cases reported in 1969 compared to 200 cases reported in 1995 resulted in a 99.65% decrease. **MMR II vaccine (Merck)** is a live virus vaccine for vaccination against measles (rubeola), mumps, and rubella (German measles). Attenuated Measles virus, derived from Enders' attenuated Edmonston strain and propagated in chick embryo cell culture, is used in MMRII vaccine.

**MMR II** is a mixture of three live attenuated viruses, administered via injection. The shot is generally administered to children around the age of one year, with a second dose before starting school (i.e. age 4/5). The vaccine is sold by Merck as M-M-R II, GlaxoSmithKline Biologicals as **Priorix**, Serum Institute of India as **Tresivac**, and Sanofi Pasteur as **Trimovax**. The component viral strains of **MMR vaccine** were developed by propagation in animal and human cells. The live viruses require animal or human cells as a host for production of more virus. For example, in the case of **mumps and measles viruses**, the virus strains were grown in embryonated hens' eggs and chick embryo cell cultures. This produced strains of virus which were adapted for the hen's egg and less well-suited for human cells. These strains are therefore called **attenuated strains**. The **Rubella component**, **Meruvax**, is propagated using a human cell line (WI-38, named for the Wistar Institute) derived in 1961 from embryonic lung tissue. The **MMRV vaccine**, a combined measles, mumps, rubella and varicella vaccine, has been proposed as a replacement for the MMR vaccine to simplify administration of the vaccines.

ADI has developed antibody ELISA kits to determine the efficacy of various existing Mumps vaccines or test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

## Mumps vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2749

| ELISA Kit Description | Species | IgG Specifc Cat# | IgM Specific Cat# | IgA Specific Cat# |
|---|---|---|---|---|
| **Mumps Vaccine** antibody ELISA kits | Human | 520-100-HMG | 520-110-HMM | 520-120-HMA |
| | Mouse | 520-130-MMG | 520-140-MMG | 520-150-MMG |

| Items | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Mumps Virus | MUMS11-S | Rabbit Anti-Mumps virus (Enders) Virus antiserum | Antibodies |
| | MUMS12-M | Monoclonal Anti-Mumps virus (Enders) Virus IgG | Antibodies |
| | MUMS15-N-500 | Mumps virus (Enders) proteins/antigens extract | Antigen |

Mumps_Vaccine_Flr Rev. 121107A



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# CpG oligodeoxynucleotides (or CpG ODNs) as Vaccine Adjuvant and ELISA kits

**CpG oligodeoxynucleotides (or CpG ODN)** are short single-stranded synthetic DNA molecules that contain an unmethylated CG (Cytosine–guanine) di nucleotide in a specific base sequence (CpG motifs). The p refers to the phosphodiester backbone. CpG oligodeoxynucleotides (ODNs) represent a novel pharmacotherapeutic class with profound immunomodulatory properties. These CpG motifs are not seen in eukaryotic DNA, in which CG dinucleotides are suppressed and, when present, usually methylated, due to this they are considered pathogen-associated molecular patterns (PAMPs). The CpG PAMP is recognized by the pattern recognition receptor (PRR) Toll-Like Receptor 9 (TLR9), which is constitutively expressed only in B cells and plasmacytoid dendritic cells (pDCs) in humans and other higher primates. Unmethylated CpG ODNs (18–24 bp in length) possess immunomodulatory properties similar to bacterial DNA and they act as immuno stimulants. The immunostimulatory properties of CpGs include induction of a Th1-type response with prominent release of IFN-Á, IL-12, and IL-18.

Synthetic CpG have a partially or completely phosphorothioated backbone instead of the typical phosphodiester backbone and a poly G tail at the 3' end, 5' end, or both. Numerous sequences have been shown to stimulate TLR9 with variations in the number and location of CpG dimers, as well as the precise base sequences flanking the CpG dimers. CpG ODNs are classified into 5 classes, based on their sequence, secondary structures, and effect on human peripheral blood mononuclear cells (PBMCs). The five classes are Class A (Type D), Class B (Type K), Class C, Class P, and Class S. Three major classes of immunostimulatory CpG-ODNs are well characterized according to their in vitro activities and chemical compositions. **Class A** stimulate the production of large amounts of Type I interferons, the most important one being IFNα, and induce the maturation of pDCs. They are also strong activators of NK cells through indirect cytokine signaling. **Class B** ODN are strong stimulators of human B cell and monocyte maturation. They stimulate the maturation of pDC to a lesser extent than Class A ODN and very small amounts of IFNα. **Class C** ODN combine features of both types A and B. They contain a complete phosphorothioate backbone and a CpG-containing palindromic motif. They induce strong IFN-α production from pDC and B cell stimulation.

Several groups have studied the sequence requirements, specificity, signaling pathways and kinetics of the TLR (Toll-like receptor) 9 suppression by '**inhibitory DNA motifs'**, which led to a revised classification of **inhibitory ODNs**. Class I: G-stretch ODNs: TLR9-specific competitors, some iODNs may also affect TLR7 and TLR8 signaling. Class II: ODNs with telomeric repeats: TLR-independent inhibitors of STAT signaling (cellular uptake via an "ODN receptor"?) Class III: Inhibitors of DNA uptake in a sequence independent manner Class IV: Long phosphorothioate ODNs as direct competitors of TLR9 signaling in a sequence independent manner.

## Product ordering Information (Data sheets and Prices are posted at the website)

| Items | Description | TLR Type | Unlabeled Cat # | Biotin Conj. Cat # | Negative Control* |
|---|---|---|---|---|---|
| ODN1585 | ODN 1585-Type A murine TLR9 agonist, Antigen grade; 5'-ggGGTCAACGTTGAgggggg-3' (20 mer) | Murine TLR9 agonist | ODN1585-1<br>ODN1585-5 | ODN1585-B | ODN1585-1NC<br>ODN1585-5NC |
| ODN 1668 | ODN 1668- Type B murine TLR9 Agonist, Antigen grade; 5'-tccatgacgttcctgatgct-3' (20 mer) | Murine TLR9 agonist | ODN1668-1<br>ODN1668-5 | ODN1668-B | ODN1668-1NC<br>ODN1668-5NC |
| ODN 1826 | ODN 1826- Type B murine TLR9 Agonist, antigen grade; 5'-tccatgacgttcctgacgtt-3' (20 mer) | Murine TLR9 agonist | ODN1826-1<br>ODN1826-5 | ODN1826-B | ODN1826-1NC<br>ODN1826-5NC |
| ODN 2006 | ODN 2006 -Type B-human TLR9 agonist, antigen grade; 5'-tcgtcgttttgtcgttttgtcgtt-3' (24 mer) | Human TLR9 agonist | ODN2006-1<br>ODN2006-5 | ODN2006-B | ODN2006-1NC<br>ODN2006-5NC |
| ODN 2007 | ODN 2007-Type B bovine/porcine TLR9 agonist, antigen grade; 5'-tcgtcgttgtcgttttgtcgtt-3' (22 mer) | Bovine TLR9 agonist | ODN2007-1<br>ODN2007-5 | ODN2007-B | ODN2007-1NC<br>ODN2007-5NC |
| ODN 2216 | ODN 2216-Type A human TLR9 Agonist, antigen grade, 5'-ggGGGACGATCGTCgggggg-3'(20 mer) | Human TLR9 agonist | ODN2216-1<br>ODN2216-5 | ODN 2216-B | ODN 2216-1NC<br>ODN 2216-5NC |
| ODN 2336 | ODN 2336-Type A human specific TLR 9 agonist, antigen grade; 5'-gggGACGACGTCGTGgggggg -3' (21 mer) | Human TLR9 agonist | ODN2336-1<br>ODN2336-1 | ODN2336-B | ODN2336-1NC<br>ODN2336-5NC |
| ODN 2395 | ODN 2395-Type C human/murine TLR9 agonist, antigen grade. 5' tcgtcgtttcggcgcgcgccg-3' (22 mer) | Human TLR9 agonist | ODN2395-1<br>ODN2395-5 | ODN2395-B | ODN2395-1NC<br>ODN2395-1NC |
| ODN M362 | ODN M362-Type C human/murine TLR9 agonist, antigen grade; 5'-tcgtcgtcgttcgaacgacgttgat-3' (25 mer) | Human TLR9 agonist | ODNM362-1<br>ODNM362-1 | ODNM362-B | ODNM362-1NC<br>ODNM362-5NC |
| AT-ODN-1 | AT ODN-Non-CpG AT rich ODN. TLR9 agonist, Antigen grade. 5'-tataattttaattccaaga-3' (20 mer) | TLR9 agonist | ATODN1-1 | 4 | 4 |
| AT-ODN-2 | AT ODN-Non-CpG AT rich ODN. TLR9 agonist, Antigen grade 5'-tataatttttaccaactagc-3' (22 mer) | TLR9 agonist | ATODN2-1 | 4 | 4 |
| AT-ODN-2 | AT ODN-Non-CpG AT rich ODN. TLR9 agonist, Antigen grade; 5'-ttaacaatttttacccaaga-3' (22 mer) | TLR9 agonist | ATODN3-1 | 4 | 4 |
| Neutral ODN | Control for inhibitory ODNs. No agonistic or Antagonist activity, Antigen grade; 5'-tgctcctggaggggttgt-3' (18 mer) | Control | ODN-NT-1 | 4 | 4 |
| ODN BW006 | ODNBW006 CpG ODN (contains structure type B sequence at 5' and Type A at the 3' end), antigen grade; 5'-tcgacgttcgtcgttcgtcgttc-3' (23 mer) | | ODN006-1 | 4 | 4 |



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## CpG oligodeoxynucleotides (or CpG ODNs) as Vaccine Adjuvant and ELISA kits

| Items | Description | TLR Tyep | Unlabeled Cat # | Biotin Conj. Cat # | Negative Control* |
|---|---|---|---|---|---|
| ODN 2088 | ODN 2088- Class I Murine TLR9 Antagonist, antigen grade; 5'-tcctggcggggaagt-3' (15 mer) | Murine TLR9 Antagonist | ODN2088-1 ODN2088-1 | 4 | ODN2088-1 ODN2088-1 |
| ODN 4084-F | ODN 4084-Type B Inhibitory TLR9 Antagonist, antigen grade; 5'-cctggatgggaa-3' (15 mer) | TLR9 Antagonist | ODN4084F-1 ODN4084F-5 | 4 | ODN4084F-1 ODN4084F-5 |
| ODN INH-1 | ODN INH-1 -Class R (restricted) inhibitory ODN-TLR 9 Antagonist, antigen grade; 5'-cctggatgggaattcccatccagg-3' (23mer) | TLR9 Antagonist | ODNIHN1-1 | 4 | 4 |
| ODN INH-47 | ODN INH-47- Class R (restricted) inhibitory ODN-TLR 9 Antagonist, antigen grade, 5'-tatggattttaattaaaatccata-3' (23mer) | TLR9 Antagonist | ODNINH47-1 | 4 | 4 |
| ODN TTAGGG | ODN TTAGGG-Inhibitory ODN Human TLR9 antagonist, Antigen grade; 5'-tttagggttagggttagggttaggg-3' (25 mer) | Human TLR9 antagonist | ODNTT-1 | 4 | ODNTT-1NC |
| G-ODN | G-ODN Murine TLR9 antagonist, Antigen grade; 5'-ctcctattgggggtttcctat-3' (21 mer) | Murine TLR9 antagonist | GODN-1 | 4 | 4 |
| Core-iODN | Inhibitory ODN class I prototype (TLR7 and TLR8), antigen grade; 5'-tcctggagggg-3' (11mer) | TLR9 and TLR7 antagonist | CIODN-1 | 4 | 4 |
| Super-iODN | Inhibitory ODN- class I/II hybrid (TLR7 and TLR8), antigen grade, 5'-cctcaatagggtgagggg-3' (18mer) | TLR9 and TLR7 antagonist | SIODN-1 | 4 | 4 |
| Dual-iODN | Inhibitory ODN-prototype class I (TLR9 and TLR7 antagonist), antigen grade; 5'-tgctcctggaggggttgt-3' (18mer) | TLR9 and TLR7 antagonist | DIODN-1 | 4 | 4 |

**Notes: 1.** Bases in capital are phosphodiester and those in lower case are phosphorothioate. Palindromic sequences are underlined. 2. Bases depicted in italics show AT-ODN sequence. 3. Negative control contains GpC nucleotides instead of CpG. 4. Contact ADI to place a special order for Biotin or FITC Conjugates.

## ELISA Kits for the study of Adjuvant effect on antibody response

The main function of adjuvants (conventional oil-based, special formulation or ODNs) is to enhance antibody response to a given antigen. The antibody levels or titer in the host species (mouse, rat, rabbit, G. pig, Ferret, Hamster, monkey or human etc) is typically measure by ELISA. ADI provides several species specific ELISA kits to measure antibody titer. These kits contain all necessary reagents, except user's specific antigen, for about 1000 tests. Please see details at:

http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2473

ADI also has ELISA kit for IgG, IgM, IgA, IgE or individual IgG isotypes (IgG1, 2a, 2b, IgG3) in serum or plasma for mouse, rat, human etc.

http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2446

### ELISA Kits for the study of Adjuvant effect on anbtibody response using model antigens

Several model proteins have been used as model antigens (Bovine serum albumin/BSA or HSA, ovalbumin or OVA, Keyhole limpet hemocyanins/KLH, thyroglobulin, DNP-KLH/Albumin or Tetanus Toxoid or TTX or Diptheria Toxoids. Adjuvants (conventional or ODN-based) have been used to study antibody response to a model antigen in a given species of host. ADI has specific antibody ELISA kits for these model antigens. Please see available kits at:

http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719
http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2449

### ELISA Kits to measure ODN-induced anti-dsDNA or anti-ssDNA anbtibody

It is possible that some DNA-sequences (ODNs) when used as adjuvant may invoke anti-DNA antibodies. The presence of absence of anti-DNA antibodies must be investigated if any ODNs is intended for vaccines.

http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2448

ODN_Vaccine_Flr rev 121107A



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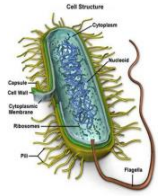
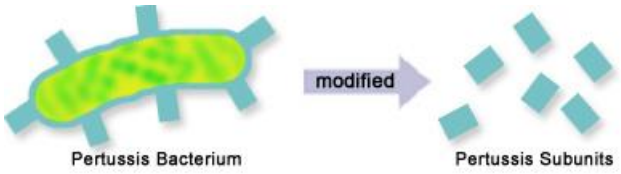
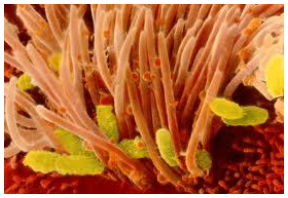
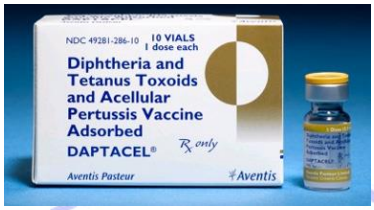
# Pertussis Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Pertussis, also known as the whooping cough, is a highly contagious disease caused by the bacterium Bordetella pertussis. It derived its name from the "whoop" sound made from the inspiration of air after a cough. Despite generally high coverage with the DTP and DTaP vaccines, pertussis is one of the leading causes of vaccine-preventable deaths world-wide.








**B. pertussis vaccine** was first developed in 1920 using whole bacterium. In 1942, the whole-cell pertussis vaccine was combined with diphtheria and tetanus toxoids to generate the first **DTP combination** vaccine. Whole cell vaccines have some side effects. **Acellular pertussis vaccine** consisting of purified haemagglutinins (HAs: filamentous HA/FHA and leucocytosis-promoting-factor HA), are being using alone or in combination with DTaP (aP represents acellular vaccine). Those with three or more components consisting of filamentous hemagglutinin (**FHA**), pertussis toxin (**PT**) and pertactin (**PRN**) are considered to be more effective than one/two-component Pa vaccines that contain only PT or both PT and FHA. Pertactin (PRN or p69 protein) is a highly immunogenic virulence factor of B. Pertussis. Specifically, it is an outer membrane protein that promotes adhesion to tracheal epithelial cells. P.69 is produced as a large (910-amino-acid) precursor molecule. It is proteolytically processed at its N and C termini to produce P.69 and P.30, which are located at the cell surface and in the outer membrane, respectively. P.69 contains the amino acid triplet arginine-glycine-aspartic acid (RGD), a sequence motif which functions as a cell-binding site in a number of mammalian proteins. Pertussis toxin has numerous biological activities and probably plays a role in hampering the host immune response. PT is a protein-based **A/B-type exotoxin**" because they are formed from two subunits. The "A" subunit possesses enzyme activity, and is transferred to the host cell following a conformational change in the membrane-bound transport "B" subunit. Pertussis toxin is an exotoxin with six subunits (named S1 through S5—each complex contains two copies of S4). Together, these proteins form the PT secretion complex. PT is involved in the colonization of the respiratory tract and the establishment of infection.

Filamentous hemagglutinin (fimbrial hemagglutinin or **FHA**) is one of two hemagglutinins produced by phase I strains of Bordetella pertussis. The use of FHA as one component of a new acellular vaccine is currently under investigation. On a weight basis, FHA is five to seven times more active in hemagglutination (HA) assays than is pertussis toxin. Moreover, the HA-activity of FHA, but not that of pertussis toxin, is abolished in the presence of low levels of cholesterol. FHA is a protein with an approximate molecular weight of 200,000 daltons.

**Pertussis Vaccines**: Trihibit (DTAP/Hib), ActHib (Hib-PRP-T), Daptacel (DTAP), Tripedia (DTAP), Adacel (tetanus, Diphtheria, Acellular Pertussis) - Sanofi Pasteur; PedvaxHib (Hib-PRP-OMP) – Merck; Pediarix (DTAP/HepB/IPV), Infanrix (DTAP), Boostrix (Tetanus, Diphtheria, Acellular Pertussis) - GlaxoSmithKline.

ADI has developed antibody ELISA kits to determine the efficacy of various Pertussis vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. ADI has also introduced industry's first **ELISA for direct testing of Pertussis Toxoid adsorbed on Alum** (for vaccine identification and testing) or in purified/semi purified preparations of toxoid during vaccine manufacturing.

## Pertussis Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2722

| Species | Species | Total IgG Cat# | IgM Specific Cat# | IgA Specific Cat# |
|---|---|---|---|---|
| B. pertussis whole vaccine (Pertussis Toxin, FHA and LPS) antibody ELISA | Human | 960-110-PHG | 960-220-PHM | 960-200-PHA |
| | Mouse | 960-120-PHG | | |
| | Monkey | 960-210-PHG | 960-220-PHM | |
| B. pertussis vaccine (Toxin/toxoid) Antibody ELISAs | Mouse | 960-130-PMG | 960-140-PMG | 960-140-PMG |
| | Rabbit | 960-150-PRG | 960-160-PRM | 960-160-PRM |
| | G. Pig | 960-170-PMG | 960-180-PMM | 960-180-PMM |
| B. pertussis vaccine (Pertactin/PRN) Antibody ELISAs | Mouse | 960-230-PGG | | |
| | Rabbit | 960-240-PRG | | |
| | Human | 960-250-PHG | | |
| | Monkey | 960-260-PMG | | |
| B. pertussis vaccine Filamentous hemeagglutinin (FHA) Antibody ELISAs | Human | 960-340-FHG | 960-350-FHM | |
| | Mouse | 960-300-FMG | 960-310-FMM | |
| | Rabbit | 960-320-FRG | 960-330-FRM | |

**VacciGel Direct ELISA for the measurement of Pertussis Toxoid (PTX) in Vaccines formulated in Alum, 96 tests, Cat # VAC-PTX-400**

**Pertussis Toxoid/Toxin (PTX) ELISA for the measurement DTX in biological buffer, cat # VAC-PTX-410**



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## Pertussis Vaccine Related Antibodies, Proteins and other Reagents

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2722

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Filamentous hemeagglutinin (FHA) | FHA11-S | Rabbit Anti-B. pertussis Filamentous hemeagglutinin (FHA) protein antiserum | Antibodies |
| | FHA15-N-10 | Filamentous Hemeagglutinin (FHA) (B. pertussis), purified | Pure protein |
| | FHA21-S | Rabbit Anti-B. pertussis Filamentous hemeagglutinin (FHA) IgM negative control for ELISA, IF, Western | Antibodies |
| | FHA22-S | Rabbit Anti-B. pertussis Filamentous hemeagglutinin (FHA) IgM positive control for ELISA, IF, Western | Antibodies |
| | FHA31-S | Rabbit Anti-B. pertussis Filamentous hemeagglutinin (FHA) IgG negative control for ELISA, IF, Western | Antibodies |
| | FHA32-S | Rabbit Anti-B. pertussis Filamentous hemeagglutinin (FHA) IgG positive control for ELISA, IF, Western | Antibodies |
| FIM | FIM235-N-10 | Recombinant purified FIMBRIAE 2/3 (FHA) (B. pertussis), antigen grade | Pure protein |
| B. pertussis Pertactin | PRN11-C | Recombinant (E. coli) B. pertussis Pertactin (91 kda) protein control for Western | Pure protein |
| | PRN11-S | Rabbit Anti-B. pertussis Pertactin (full length, 91 kda) protein antiserum | Antibodies |
| | PRN15-R-10 | Recombinant (E. coli) B. pertussis Pertactin (full length, 91 kda, his-tag) purified protein | Pure protein |
| B. pertussis Toxin | PTOX15-N-50 | Pertussis Toxin (islet activating protein, B. pertussis), purified | Pure protein |
| | PTOX15-S | Rabbit Anti-B. pertussis Toxin IgM negative control for ELISA, IF, Western | Antibodies |
| | PTOX16-S | Rabbit Anti-B. pertussis Toxin IgM positive control for ELISA, IF, Western | Antibodies |
| | PTOX17-S | Rabbit Anti-B. pertussis Toxin IgG negative control for ELISA, IF, Western | Antibodies |
| | PTOX18-S | Rabbit Anti-B. pertussis Toxin IgG positive control for ELISA, IF, Western | Antibodies |
| | PTOX21-S | G. Pig Anti-B. pertussis Toxin IgG negative control for ELISA, IF, Western | Antibodies |
| | PTOX22-S | G. Pig Anti-B. pertussis Toxin IgG positive control for ELISA, IF, Western | Antibodies |
| | PTOX23-S | G. Pig Anti-B. pertussis Toxin IgM negative control for ELISA, IF, Western | Antibodies |
| | PTOX24-S | G. Pig Anti-B. pertussis Toxin IgM positive control for ELISA, IF, Western | Antibodies |
| | PTOX31-S | Mouse Anti-B. pertussis Toxin IgG positive control for ELISA, IF, Western | Antibodies |
| | PTOX32-S | Mouse Anti-B. pertussis Toxin IgM negative control for ELISA, IF, Western | Antibodies |
| | PTOX33-S | Mouse Anti-B. pertussis Toxin IgG negative control for ELISA, IF, Western | Antibodies |
| | PTOX34-S | Mouse Anti-B. pertussis Toxin IgG positive control for ELISA, IF, Western | Antibodies |
| | PTOX35-N-10 | Pertussis Toxin A promoter (B. pertussis), purified | Pure protein |
| | PTOX36-N-10 | Pertussis Toxin B promoter (B. pertussis), purified | Pure protein |
| | PTOX41-F | Monoclonal Anti-B. pertussis LPS (Los-A) IgG-FITC Conjugate | Antibodies |
| | PTOX41-M | Monoclonal Anti-B. pertussis/B.bronchiseptica LPS (Los-A) IgG unlabeled | Antibodies |
| | PTOX42-M | Monoclonal Anti-B. pertussis Toxin IgG unlabeled | Antibodies |
| | PTOX43-M | Monoclonal Anti-B. pertussis Toxin subunit S1, IgG unlabeled | Antibodies |
| | PTOX44-M | Monoclonal Anti-B. pertussis Toxin subunit S2, IgG unlabeled | Antibodies |
| | PTOX45-M | Monoclonal Anti-B. pertussis Toxin subunit S3, IgG unlabeled | Antibodies |



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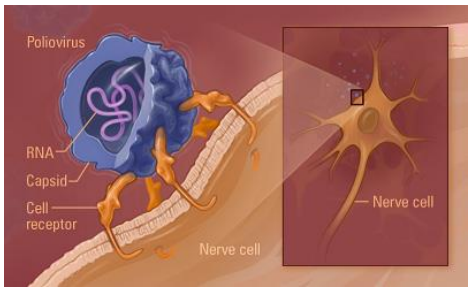
## Polio Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies





Poliomyelitis, often called polio or infantile paralysis, is an acute viral infectious disease spread from person to person, primarily via the fecal-oral route. Although around 90% of polio infections cause no symptoms at all, affected individuals can exhibit a range of symptoms if the virus enters the blood stream. In about 1% of cases the virus enters the central nervous system, preferentially infecting and destroying motor neurons, leading to muscle weakness and acute flaccid paralysis. Different types of paralysis may occur, depending on the nerves involved. Spinal polio is the most common form, characterized by asymmetric paralysis that most often involves the legs. Bulbar polio leads to weakness of muscles innervated by cranial nerves. Bulbospinal polio is a combination of bulbar and spinal paralysis.

The term poliomyelitis is used to identify the disease caused by any of the three serotypes of poliovirus. Two basic patterns of polio infection are described: a minor illness which does not involve the central nervous system (CNS), sometimes called abortive poliomyelitis, and a major illness involving the CNS, which may be paralytic or non-paralytic. In most people with a normal immune system, a poliovirus infection is asymptomatic. The virus enters the central nervous system in about 3% of infections. Most patients with CNS involvement develop non-paralytic aseptic meningitis, with symptoms of headache, neck, back, abdominal and extremity pain, fever, vomiting, lethargy and irritability. Approximately 1 in 200 to 1 in 1000 cases progress to paralytic disease, in which the muscles become weak, floppy and poorly controlled, and finally completely paralyzed; this condition is known as acute flaccid paralysis. Depending on the site of paralysis, paralytic poliomyelitis is classified as spinal, bulbar, or bulbospinal. Encephalitis, an infection of the brain tissue itself, can occur in rare cases and is usually restricted to infants. It is characterized by confusion, changes in mental status, headaches, fever, and less commonly seizures and spastic paralysis.

A laboratory diagnosis is usually made based on recovery of poliovirus from a stool sample or a swab of the pharynx. Antibodies to poliovirus can be diagnostic, and are generally detected in the blood of infected patients early in the course of infection. Analysis of the patient's cerebrospinal fluid (CSF), which is collected by a lumbar puncture ("spinal tap"), reveals an increased number of white blood cells (primarily lymphocytes) and a mildly elevated protein level. Detection of virus in the CSF is diagnostic of paralytic polio, but rarely occurs.

Two types of vaccines are used throughout the world to combat polio. The first is Salk vaccine, or inactivated poliovirus vaccine (IPV), is based on poliovirus grown in a type of monkey kidney tissue culture (Vero cell line), which is chemically inactivated with formalin. Subsequently, Albert Sabin developed another live, oral polio vaccine (OPV). It was produced by the repeated passage of the virus through non-human cells at sub-physiological temperatures.

ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. The ADI's Poliomyelitis IgG ELISA Kit is an immunoassay suitable for detecting IgG in serum, plasma or other biological fluids. ADI has also introduced industry's first ELISA for direct testing of Diphtheria Toxoid adsorbed on Alum (for vaccine identification and testing) or in purified/semi-purified preparations of toxoid during vaccine manufacturing.

## Related ELISA kits (See Details at the website)

http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2727

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| **Polio Vaccine Antibody ELISA Kits** | Human | 970-100-PHG | |
| | Mouse | 970-120-PMG | |
| | Rabbit | 970-130-PRG | 970-130-PRM |
| | Monkey | 970-150-PMG | |

## Polio Related Antibodies, Peptides, and Recombinant Proteins Ordering Information

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2727

| Item | Catalog # | Product Description | Product Type |
|---|---|---|---|
| Polio Virus | POLV11-S | Rabbit Anti-Poliomyelitis Virus 1-3 antiserum | Antibodies |
| | POLV12-M | Mouse monoclonal Anti-Poliomyelitis Virus 1-3 IgG, aff pure | Antibodies |
| | POLV13-A | Goat Anti-Poliomyelitis Virus 1-3 IgG | Antibodies |
| | POLV13-BTN | Goat Anti-Poliomyelitis Virus 1-3 IgG-Biotin Conjugate | Antibodies |
| | POLV13-FITC | Goat Anti-Poliomyelitis Virus 1-3 IgG-FITC Conjugate | Antibodies |
| | POLV13-HRP | Goat Anti-Poliomyelitis Virus 1-3 IgG-HRP Conjugate | Antibodies |

Polio_Vaccine_Flr Rev. 130207A



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**Toxoplasmosis** is a disease caused by a parasite called **Toxoplasma gondii**. The parasite mostly infects warm-blooded animals including humans but the primary host is the felid (cat) family. The primary hosts are the cats they carry the virus and can possibly infect other animals. Pigs can get infected by eating contaminated water and food with cat feces, or by eating other contaminated dead pigs' ears, and tails, or by eating infected rodents or other uncooked meat. Once the parasites invade the pigs' organisms it will form cysts in muscles and other organs where they remain viable for long periods of time. The parasites will mature and eventually it can be a source to infect human. The presence of the parasites in pigs rarely results in clinical disease unless infection occurs in pregnant pigs which can lead to SMEDI (stillbirth, mummification, embryonic death and infertility). If a human eats pig meat infected with Toxoplasma gondii, it will show two stages; acute and latent. During acute toxoplasmosis will include the following symptoms; swollen lymph nodes and muscle aches. Latent toxoplasmosis is the time where bradyzoites will form cysts in nervous and muscle tissue. Toxoplasmosis parasite can also trigger schizophrenia, bipolar disorders, Parkinson's Disease, Tourette's syndrome and ADD (attention deficit disorders). Over half of the world's human population is estimated to carry a Toxoplasma infection. Trimethoprim/sulfamethoxazole is the drug of choice to prevent Toxoplasma, but is not the drug to treat. Swine have received special attention from the public health because they are an important reservoir of Toxoplasma for human populations due to the longevity of the tissue cysts, and the wide dissemination of the infection in this animal species. **Toxovax (Merck)** is a live vaccine containing >$10^5$ tachyzoites of the S48 strain of Toxoplasma gondii per dose for sheep or other animals. Vaccination with Toxovax is known to protect for at least two lambing seasons.

**Foot-and-mouth disease (FMD)** is caused by the foot-and-mouth disease virus (**FMDV**) which is a single stranded RNA virus from the Picomaviridae family and Aphthovirus genus. It is a very small nonenveloped icosahedral virus. The foot-and-mouth disease virus occurs in seven major serotypes: O, A, C, SAT-1, SAT-2, SAT-3, and Asia-1. These serotypes show some regionality, and the O serotype is most common. FMDV is a very contagious disease and can be death threatened. It can infect cattle, water buffalo, sheep, goats and pigs, but not human. The symptoms of this disease include fever and blister-like lesions followed by erosions on the tongue and lips, in the mouth and between the hooves. **Raksha fmd vaccine (India)** contains inactivated fmd virus strains o, a, c and asia-1 adsorbed on aluminium hydroxide as an adjuvant. **FMD vaccine (intervet, Merck**) Decivac® FMD DOE contain antigens of the FMDV types O, A, C, Asia1 and SAT1, SAT2, SAT3 (monovalent or multivalent) for the active immunisation of pigs, cattle, buffalo, sheep and goats against Foot and Mouth Disease.

**Pseudorabies** is a viral disease in swine which is caused by porcine herpesvirus 1, which is also called psedorabies virus (**PRV**) or suid herpesvirus-1 (SuHV-1) and is also known as Aujeszky's disease, and in cattle as mad itch.. PRV is considered to be the most economically important viral disease of swine in areas where hog cholera has been eradicated. The word "pseudorabies" means "false rabies," or "rabies-like;" pseudorabies is related to the herpes virus, not the rabies virus. PRV is in the group I double stranded DNA from the family Herpesviridae and genus Varicellovirus. PRV infected pigs show no clinical symptoms unless it infects pregnant pigs which will lead to SMEDI (stillbirth, mummification, embryonic death and infertility). Adult pigs are the host carrier for the virus, but it will infect cattle, sheep, cats, dogs, goats, raccoons, opossums, skunks and rodents. Symptoms for those infected animals are scratching and biting themselves followed by neurological sings and eventually death. For dogs and cats pseudorabies is so dangerous that it can cause sudden death without even having symptoms. However, PRV are harmless in human. **Pseudorabies** vaccines (Pocilis AD Begonia, Merck) A live attenuated vaccine for the immunization of pigs against Aujeszky's disease virus infections (Pseudorabies). The vaccine based on the virus strain NIA-3(tk- and gE-). Diluvac Forte® is used as a diluent. The gE deletion allows field infections to be differentiated from vaccination responses.


**Hog Cholera** is also called Classical swine fever (**CSF**). It is very contagious among pigs and wild boar. The virus responsible for this disease is called CSFV. It is classified in the Group IV ((+) ssRNA), it is a lipid-enveloped pathogen which belongs to the genus Pest virus in the family of Flaviviridae. CSFV is very similar to a ruminant pestiviruses which cause Bovine Viral Diarrhoea (BVDV) and Border Disease (BDV). Pigs and wild boars are the only hosts for CSV. The virus will live in the blood, tissues, secretions and excretions from the infected animal. It is transmitted mostly by the oral route, conjunctiva, mucous membrane, skin abrasion, insemination and percutaneous blood transfer. Once the animal is infected the incubation period is normally from 3 to 4 days but can range between 2 to 14 days. After four days to three weeks of the virus entered the animal's system the symptoms will start with fever which will lead to loss of appetite, depression, withdrawal from other animals, reddened and draining eyes, vomiting, constipation or diarrhea, and coughing and difficulty in respiration. CSFV is diagnosed by histology or the presence of antibodies by ELISA. Porcilis CSF Live is based on the Classical Swine Fever virus strain GPE-. The resulting vaccine is highly effective and proven safe as it does not spread to other pigs. The resulting vaccine is highly effective and proven safe as it does not spread to other pigs.



**Porcine Circovirus (PCV**) is a single stranded DNA virus (group II). It is a non-enveloped with an un-segmented circular genome. PCV is the smallest virus to be able to replicate autonomously in eukaryotic cells. PCV replicates in the nucleus of infected cells using the host's polymerase for genome amplification. There are two strains, the Type 1 PCV and Type 2 PCV. Type 1 PCV has not been found any disease affecting swine. Type 2 PCV causes postweaning multisystemic wasting syndrome (PMWS) which eventually leads to depletion of lymphocytes. Side effect of PCV2 infection includes poor growth, weight loss, enlarged lymph nodes, difficulty breathing, jaundice, fever, stomach ulcers, diarrhea and sudden death. An effective vaccination is now available. Fostera PCV2 vaccine (Fort Dodge) contains inactivated virus (ATCvet code: QI09AA07). Porcilis vaccine against porcine circovirus type 2 (PCV2) contains ORF2 subunit antigen: at least 4.5 log2 ELISA units For the active immunisation of pigs to reduce the virus load in blood and lymphoid tissues and to reduce mortality and weight loss associated with PCV2 infection occurring during the fattening period
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**Porcine Encephalitis** Virus is also known as **Japanese Encephalitis virus (JEV)**. Japanese encephalitis virus is the virus responsible for the Japanese B encephalitis disease. JEV is a positive single stranded enveloped RNA virus that belongs to the Flaviviridae family from the genus Flavivirus. JEV is called arbovirus because it is transmitted by the Culex tritaeniorhynchus mosquitoes. The main reservoir of JEV is the pigs, and once transmitted to human it can cause severe symptoms. The pigs infected by the virus shows no symptoms except in pregnant ones which will lead to miscarriage or abnormal fetus. Human can get infected with the virus by the Culex mosquitoes. Mosquitoes will become infected when they fed themselves with infected pigs, those mosquitoes now can infect human. This virus cannot be transferred from human to human or pigs to human, only from mosquitoes to humans. Once the virus enters the human body it follows an incubation period of four to fourteen days. The symptoms will start with fever and headache, however it can progress giving worse symptoms such as neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions and spastic paralysis. Japanese Encephalitis Vaccine, JE-VC (Novartis), contains strain SA14-14-2 Inactivated, adsorbed, and it is for human use.


**Porcine Reproductive and Respiratory Syndrome** (PRRS) is also known as Blue-Ear Pig Disease. It is a virus that causes a disease of pigs, called porcine reproductive and respiratory syndrome (PRRS). This economically important, pandemic disease causes reproductive failure in breeding stock and respiratory tract illness in young pigs. Initially referred to as "mystery swine disease" and "mystery reproductive syndrome, It is a disease that is caused by the virus **PPRSV** (Porcine Reproductive and Respiratory Syndrome Virus). The disease costs the United States swine industry around $600 million annually. PRRSV is a small enveloped single stranded positive sense RNA virus. The virus has a high affinity for the macrophage found in the lung. The virus multiplies itself inside the macrophage which eventually kills the macrophage. Without macrophages the body has no defense mechanism, allowing other bacteria and viruses to proliferate and damage the body. The two prototype strains of PRRSV are the North American strain, VR-2332, and the European strain, the Lelystad virus (LV). The European and North American PRRSV strains cause similar clinical symptoms. Porcilis PRRS vaccine (Merck) for piglest and sows is a Live attenuated PRRS virus strain DV


**Porcine Parvovirus (PPV**) is a Group II, a single stranded DNA virus from the family Parvoviridae and its genus is Parvovirus. PPV is one of the most common causes of infectious infertility. It is a very strong virus which multiplies itself in the pig's intestine without giving the pig any symptoms. PPV is a very difficult virus to remove from the pig's environment. PPV has unique characteristics of being resistant to most disinfectants and being able to survive living outside of its host for a long period of time. PPV will show symptoms in pregnant pigs only if the pregnancy is for the first time during the first 55 days. Its structure is composed of a viral capsid made of 2-3 proteins known as VP1-3 which forms an icosahedral structure. This specific structure makes the virus resistant to pH, solvents and temperature as high as 50 °C. PPV causes a reproductive disease in pigs called SMEDI which stands for stillbirth, mummification, embryonic death and infertility. The disease is mostly spread by ingestion of contaminated food and water, infected feces and sometimes sexual contact and contact with aborted tissue. PARVOSUIN® vaccine is an Inactivated porcine parvovirus, NADL-2 strain: ≥ 1/32 HAI;in oil adjuvant.

Alpha Diagnostic Intl's has developed ELISA kits to detect and measure the presence of antbodies to various Procine/Swine/Hog viral diseases (Toxoplasmosis, Swine Foot and Mouth Virus (FMDV), Pseudorabies (PRV), Classical Swine Flu (CSFV), Porcine Circovirus (PCV2), Porcine/Swine Epidemic Encephalitis B (JEV), Porcine Parvovirus (PPV), and **Porcine Reproductive and Respiratory Syndrome** (PRRS).

**Porcine/Pig/Swine Diseases/Vaccine Related ELISA kits**

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2746

| Items Description | Antibody Type IgG Cat# |
|---|---|
| Swine/Porcine **Toxoplasmosis** Antibody ELISA kit | AE-200100-2 |
| Swine Foot and Mouth Virus (**FMDV**) antibody ELISA kit | AE-200120-2 |
| Swine Foot and Mouth Disease (**FMDV**) IgG Distinguishing kit | AE-200125-2 |
| Porcine/Swine Pseudorabies (**PRV**) Antibody ELISA kit | AE-200130-2 |
| Porcine/Swine Pseudorabies (**PRV**) Virus IgE Antibody Distinguishing kit | AE-200135-2 |
| Swine/Hog) Classical Swine Flu (**CSFV**) or Cholera Virus Antibody ELISA kit | AE-200140-2 |
| Porcine Circovirus (**PCV2**) ELISA kit, 4x96 tests | AE-200150-2 |
| Porcine/Swine Epidemic Encephalitis B (**JEV**) antibody ELISA kit | AE-200160-2 |
| Swine/Porcine Parvovirus (**PPV**) Antibody ELISA kit, 2x96 tests | AE-200170-2 |
| Porcine Reproductive and Respiratory Syndrome virus (**PRRSV**) Antibody ELISA kit | AE-200180-2 |

Porcine_Swine_Vaccine_Flr Rev. 120110A

## Rabies Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies



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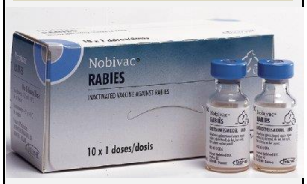
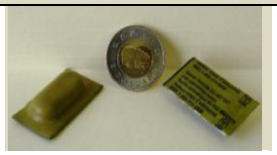
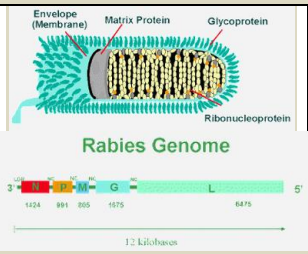
**Rabies** is a disease that causes acute encephalitis (inflammation of the brain) in warm-blooded animals. It is zoonotic (i.e., transmitted by animals), most commonly by a bite from an infected animal but occasionally by other forms of contact. Rabies is almost invariably fatal if post-exposure prophylaxis is not administered prior to the onset of severe symptoms. Early-stage symptoms of rabies are malaise, headache and fever, progressing to acute pain, violent movements, uncontrolled excitement, depression, and hydrophobia. Worldwide, the vast majority of human rabies cases (~ 97%) come from dog bites. Rapid and accurate laboratory diagnosis of rabies in humans and other animals are essential for timely administration of post exposure prophylaxis. The nature of rabies disease dictates that laboratory tests be standardized, rapid, sensitive, specific, economical, and reliable. The standard test for rabies testing is dFA and RFFIT. However, these test labor intensive, take a long time, and also require handling of the live virus, and more expensive. They are also not suited for large sample testing or field trials.

Human Rabies Vaccine



Recombinant Oral VRG Vaccine bait for animals (Coyote, racoon, etc)




The rabies virus is a member of the Lyssavirus genus, which are approximately cylindrical in shape. They are characterized by an extremely broad host spectrum ranging from plants to insects and mammals; human-infecting viruses. The lipoprotein envelope carries knob-like spikes composed of **Glycoprotein G**. Spikes do not cover the planar end of the virion (virus particle). Beneath the envelope is the membrane or matrix (M) protein layer which may be invaginated at the planar end. The core of the virion consists of helically arranged **ribonucleoprotein.**

ADI's Anti-Rabies ELISA kit is based on whole-inactivated virus or recombinant proteins (**VRG and RV-NP**) are intended to use as a rapid screening test for the detection of rabies antibodies in serum samples of experimental animals to test the efficacy of existing vaccines or new formulation of vaccines. **Rabies vaccines**: Vaxirab, Verorab, Raboral (Merial). **VRG vaccine** is the recombinant vaccinia virus containing the rabies glycoprotein. It is used extensively to immunize wild animals (bats, coyote raccoons etc).

## Rabies vaccine Related ELISA kits (See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2726)

| ELISA Kit Description | Species | Total Ig'Cat# | IgG Specific Cat# | IgM Specific Cat# |
|---|---|---|---|---|
| Rabies Vaccine (**Rabies Virus 1-3**) antibody ELISA Kits | Dog | | 600-010-DRV | |
| | Human | | 600-020-HRV | |
| | Mouse | | 600-030-MRG | |
| | Rabbit | | 600-040-RRG | 600-045-RRM |
| | Horse | | 600-050-HRG | |
| | Dog/Canine | 600-060-CRG | | |
| | Monkey | 600-070-CRG | | |
| | Pig/Swine | | 600-080-PRG | |
| | Ferret (Fishers/Skunks) | | 600-090-FRG | |
| Rabies Vaccine (**Rabies Virus Glycoprotein** (RVG) antibody) ELISA Kits | Dog Fox/Coyote | | 600-110-DRV | |
| | Human | | 600-120-HRV | |
| | Mouse | | 600-130-MRG | |
| | Rabbit | | 600-140-RRG | |
| | Horse | | 600-150-HRG | |
| | Swine/Pig | | 600-160-PRG | |
| | Ferret (Fishers/Skunks) | | 600-170-FRG | |
| Rabies Vaccine (**Rabies Virus Nucleoprotein** (RV-NP) antibody) ELISA Kits | Dog/Fox/Coyote | 600-210-DRV | 600-210-DRV | |
| | Human | | 600-220-HRV | |
| | Mouse | | 600-230-MRG | |
| | Rabbit | | 600-240-RRG | |
| | Horse | | 600-250-HRG | |
| **Pseudorabies** Antibody ELISA kits | Swine/Porcine | | AE-200130-2 | |

## Rabies Related Antibodies, Peptides, and Recombinant Proteins

| Items | Cat# | Product Description | Product Type |
|---|---|---|---|
| Rabies **Virus VRG RV-NP** | RBV14-M | Mouse monoclonal Anti-Rabies Virus IgG, aff pure | Antibodies |
| | RBV12-FITC | Goat Anti-Rabies Virus IgG-FITC conjugate | Antibodies |
| | RBV12-S | Rabbit Anti-Rabies Virus antiserum | antiserum |
| | RBV11-M | Mouse monoclonal Anti-Rabies Virus IgG, aff pure | Antibodies |
| | RBVGP11-S | Rabbit Anti-Rabies Virus Glycoprotein (~58 kda, RVG) antiserum | antiserum |
| | RBVGP25-R-10 | Recombinant (E. coli) purified Rabies Virus Glycoprotein (~58 kda, RVG) | Pure protein |
| | RBVNP12-S | Rabbit Anti-Rabies Virus Nucleoprotein (RV-NP) (~56 kda, RV-NP) antiserum | antiserum |
| | RBVNP15-R-10 | Recombinant (yeast) purified nucleocapsid protein (full length ~56 kda, yeast, >95%) | Pure protein |

Rabies_Vaccine_Flr 130207A

## RecombiVirus Anti-Epizootic Diarrhea of Infant Mice (EDIM)/Rotavirus ELISA Kits



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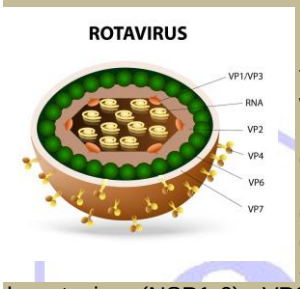
## General Information

Animals, just like humans, are susceptible to various bacterial and viral infections. Animals are used widely in biomedical research. Laboratory animal infections may compromise the health of the animals and ultimately the research data derived from them. Animals or animal-derived products (purified protein or cell lines) are transported from one part of the world to another in a matter of days. So there is great potential for the diseases to spread very quickly. Many infections are asymptomatic and without any overt clinical symptoms. Detection of microbial infections has relied largely on serological screening and presence of microbial antigens or antibodies.

Diarrhea in young laboratory mice is often caused by mouse rotavirus, also called epizootic diarrhea of infant mice (**EDIM**). This virus is highly contagious and is transmitted via contaminated bedding, airborne dust, and through contact with infected mice. These animals present with watery, mustard-colored stools, lethargy, and distended abdomens. **Rotavirus infections** are the primary causes of severe gastroenteritis in young children and are the cause of nearly one million deaths worldwide each year. Diagnosis is usually based on serology, via ELISA or IFA or both.




EDIM or rotavirus is a genus of dsRNA virus in the family Reoviridae. There are five species of this virus (A-E). Rotavirus A, the most common, causes more than 90% of infections in humans. Rotaviruses infect the young of many species of animals and they are a major cause of diarrhoea in wild and reared animals worldwide. As a pathogen of livestock, notably in young calves and piglets, rotaviruses cause economic loss to farmers because of costs of treatment associated with high morbidity and mortality rates. The genome of rotavirus consists of 11 unique double helix molecules of RNA which are 18.5kb in total. Each helix, or segment, is a gene, numbered 1 to 11 by decreasing size. Each gene codes for one protein, except genes 9, which codes for two. The RNA is surrounded by a three-layered icosahedral protein capsid. There are six viral structural capsid proteins (VP1-4, VP6-7) that form the virus particle (virion). In addition to the VPs, there are six nonstructural proteins (NSPs), that are only produced in cells infected by rotavirus (NSP1-6). VP6 forms the bulk of the capsid. It is highly antigenic and can be used to identify rotavirus infections. VP6 protein of the murine rotavirus strain EDIM are able to elicit protection against rotavirus shedding in the adult mouse model. VP6-based human vaccines are in active clinical

Antibodies to yeast mannans are found at increased frequency in Crohn's disease (**CD**) and ASCA+ Crohn's tend to have lower low levels of mannan-binding lectin. Antibodies to mannans from yeast can also crossreact to mannans of other types of yeast. The mannotetraose (4-mer) was responsible for highest antibody response. Mannans from other yeast, for example candida albicans, have found to cross react with **ASCA** (Anti-Saccharomyces cerevisiae antibodies) which suggests that other yeast may induce ASCA associated diseases. For example, ASCA are found in **Bechet's Disease, Celiac Disease, Colitis and Crohn's Disease**. Little is known about the origin of ASCA, but these antibodies clearly reflect an abnormal immune sensitization in CD patients.

**Anti-Saccharomyces cerevisiae antibodies (ASCAs)** or **Anti-yeast Mannan** (IgA, IgG or IgM) specific ELISA kits are designed to detect and measure anti-ASCA antibodies in sera of animals of humans. Samples are typically used at 1:100 or more in the ELISA test (115 min, at room temp). Isotype-specific ELISA kits measures only one isotype (IgA, IgG or IgM). ELISA kits for mouse, rat, and human samples are currently available but other species can be requested as special order. All ELISAs follow the similar design so this brief brochure represents general features of anti-ASCA ELISAs. Detailed manual is provided with the kit.

ADI has developed antibody ELISA kits to determine and measure antibodies against the yeast mannans. These kits will help study the role of ASCA in various GI tract diseases.

## Anti-ASCA Related ELISA kits and other reagents.

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2448

| Items Description | Species | IgG Specific Cat # | IgM Specific Cat# | IgA Specific Cat# |
|---|---|---|---|---|
| Anti-ASCA (anti-S. cerevisiae Antibodies or anti-mannan) ELISA Kits, 96 tests | Human | 3300-320-ASC | | |
| | Mouse | 680-500-ASG | 680-505-ASM | 680-510-ASA |
| | Rat | 680-520-ASG | 680-525-ASM | 680-530-ASA |

Rotavirus Vaccines_flr 130215A



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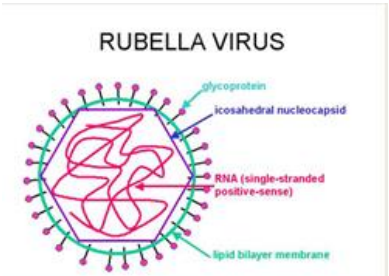
## Rubella Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies





**Rubella**, commonly known as **German measles**, is a disease caused by the rubella virus. The name "rubella" is derived from the Latin, meaning little red. The name rubella is sometimes confused with rubeola, an alternative name for measles; the diseases are unrelated. Rubella is a common childhood infection usually with minimal systemic upset although transient arthropathy may occur in adults. Serious complications are very rare. Acquired (i.e. not congenital) rubella is transmitted via airborne droplet emission from the upper respiratory tract of active cases. There is no carrier state: the reservoir exists entirely in active human cases. The disease has an incubation period of 2 to 3 weeks. The disease is caused by Rubella virus, a togavirus that is enveloped and has a single-stranded RNA genome. Rubella virus specific IgM antibodies are present in people recently infected by Rubella virus but these antibodies can persist for over a year and a positive test result needs to be interpreted with caution. Rubella infections are prevented by active immunization programs using live, disabled virus vaccines. Two **live attenuated virus vaccines**, RA 27/3 and Cendehill strains were effective in the prevention of adult disease. However their use in pre pubertile females did not produce a significant fall in the overall incidence rate of CRS in the U.K. Reductions were only achieved by immunization of all children. The vaccine is now usually given as part of the MMR vaccine.

**Rubella virus** is the only member of the genus of Rubivirus and belongs to the family of Togaviridae, whose members commonly have a genome of single-stranded RNA of positive polarity which is enclosed by an icosahedral capsid. There are prominent "spikes" (projections) of 6 nm composed of the viral envelope proteins **E1** and **E2** embedded in the membrane. The E1 glycoprotein is considered immunodominant in the humoral response induced against the structural proteins and contains both neutralizing and hemagglutinating determinants. The genome has 9,762 nucleotides and encodes 2 nonstructural polypeptides (p150 and p90) within its 5′-terminal two-thirds and 3 structural polypeptides (C, E2, and E1) within its 3′-terminal one-third. Both envelope proteins E1 and E2 are glycosylated.

**MMR II** vaccine is a mixture of three live attenuated viruses, administered via injection. The vaccine is sold by Merck as M-M-R II, GlaxoSmithKline Biologicals as **Priorix**, Serum Institute of India as **Tresivac**, and Sanofi Pasteur as **Trimovax**. The live viruses require animal or human cells as a host for production of more viruses. For example, in the case of mumps and measles viruses, the virus strains were grown in embryonated hens' eggs and chick embryo cell cultures. This produced strains of virus which were adapted for the hen's egg and less well-suited for human cells. These strains are therefore called attenuated strains. The Rubella component, **Meruvax**, is propagated using a human lung cell line (WI-38). The **MMRV vaccine**, a combined measles, mumps, rubella and varicella vaccine, has been proposed as a replacement for the MMR vaccine to simplify administration of the vaccines.

ADI has developed antibody ELISA kits to determine the efficacy of existing Rubella vaccines or test new vaccines.

### Rubella vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2750

| ELISA Kit Description | Species | IgG Specific Cat# | IgM Specific Cat# |
|---|---|---|---|
| **Rubella Vaccine** (Virus Antibody) ELISA Kits | Human | 510-100-HRG | 510-110-HRM |
| | Mouse | 510-120-MRG | 510-130-MRM |
| | Mouse | 510-100-HRG | 510-110-HRM |

### Rubella Related Antibodies, Peptides, and Recombinant Proteins Ordering Information

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2750

| item | Catalog # | Product Description | Product Type |
|---|---|---|---|
| Rubella Virus | RUBL11-A | Goat Anti-Rubella virus (HPV77 strain) IgG | Antibodies |
| | RUBL11-BTN | Goat Anti-Rubella virus (HPV77 strain) IgG-Biotin conjugate | Antibodies |
| | RUBL11-FITC | Goat Anti-Rubella virus (HPV77 strain) IgG-FITC conjugate | Antibodies |
| | RUBL11-HRP | Goat Anti-Rubella virus (HPV77 strain) IgG-HRP conjugate | Antibodies |
| | RUBL12-M | Monoclonal Anti-Rubella virus (HPV72) IgG, aff pure | Antibodies |
| | RUBL15-N-500 | Rubella virus (HPV77 strain) proteins/antigens extract | Antibodies |
| E1 protein | RP-1413 | Recombinant Rubella Virus E1 Mosaic protein | Pure protein |
| | RUBL17-M | Monoclonal Anti-Rubella virus strucural glycoprotein E1 IgG, aff pure | Antibodies |
| | RUBL13-M | Monoclonal Anti-Rubella virus envelop protein E1 IgG, aff pure | Antibodies |
| E2 Protein | RUBL14-M | Monoclonal Anti-Rubella virus envelop protein E2 IgG, aff pure | Antibodies |
| | RP-1414 | Recombinant Rubella Virus E2 protein | Pure protein |
| Capsid | RP-1415 | Recombinant Rubella Virus Capsid C protein | Pure protein |
| | RUBL15-M | Monoclonal Anti-Rubella virus capsid protein IgG, aff pure | Antibodies |
| Core | RUBL16-M | Monoclonal Anti-Rubella virus core protein IgG, aff pure | Antibodies |

Rubella_vaccine_Flr 130207A



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## Streptococcus Pneumoniae Vaccines: ELISA Kits, Carbohydrates and Antibodies

**Streptococcus pneumoniae**, or pneumococcus, is a Gram-positive, alpha-hemolytic, aerotolerant anaerobic member of the genus Streptococcus. The organism causes many types of pneumococcal infections other than pneumonia. These invasive pneumococcal diseases include acute sinusitis, otitis media, meningitis, bacteremia, sepsis, osteomyelitis, septic arthritis, endocarditis, peritonitis, pericarditis, cellulitis, and brain abscess. S. pneumoniae is one of the most common causes of bacterial meningitis in adults and young adults, along with Neisseria meningitidis, and is the leading cause of bacterial meningitis in adults in the world. S. pneumoniae have a polysaccharide capsule that acts as a virulence factor for the organism; more than 90 different serotypes are known, and these types differ in virulence, prevalence, and extent of drug resistance. The genome of S. pneumoniae is a closed, circular DNA structure that contains a core set of 1553 genes, plus 154 genes in its virulome, which contribute to virulence, and 176 genes that maintain a noninvasive phenotype. Genetic information can vary up to 10% between strains. Diagnosis is generally made based on clinical suspicion along with a positive culture from the samples. S. pneumoniae is, in general, optochin sensitive, although optochin resistance has been observed. Worldwide, Streptococcus pneumoniae (pneumococcus) is a significant cause of morbidity and mortality, especially in infants and elderly people. Serotype specific antibodies against the capsular polysaccharides provide protection against the corresponding serotypes. Serotypes specific polysaccharides (free or conjugated to CRM197) are the active ingredients of various vaccines.

A pneumococcal vaccine is a vaccine against Streptococcus pneumoniae. Types include **Pneumococcal polysaccharide vaccine** & **Pneumococcal conjugate** vaccine. The polysaccharide vaccine most commonly used today consists of purified polysaccharides from 23 serotypes (1, 2, 3, 4, 5, 6b, 7F, 8,9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19F, 19A, 20, 22F, 23F and 33F). **Pneumovax-23 by Merck** contains purified polysaccharides from 23 serotypes and it is not conjugated. Pneumococcal conjugate vaccine (PCV) contains polysaccharides conjugated to diphtheria toxin CRM197. There are currently three PCV vaccines available on the global market: Prevnar (called Prevenar in some countries), **Synflorix** and Prevnar 13. **Prevnar-7 or PCV-7** (Wyeth) is a heptavalent vaccine (4,6B,9V,14,18C,19F, and 23F), **Synflorix** (GlaxoSmithKline) is a decavalent vaccine (**PCV-10**), meaning that it contains ten serotypes of pneumococcus (1, 4, 5, 6B, 7F, 9V, 14, 18C, 19F, and 23F). **Prevnar 13/PCV-13** (Pfizer) is a triskaivalent vaccine, meaning that it contains thirteen serotypes of pneumococcus (1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F) which are conjugated to a carrier protein.




**Non conjugated vaccine** (**Pneumovax**) immunity is induced primarily through stimulation of B-cells which release IgM without the assistance of T cells. Pneumovax) gives at least 85% protection in those under 55 years of age for five years or longer. Immunization is suggested for those at highest risk of infection, including those 65 years or older; generally the vaccine should be a single lifetime dose, as there is a high risk of side effects if repeated. The standard 23-valent vaccines are ineffective for children under two years old. **Conjugated vaccine** (Prevnar, Synoflorix) consists of capsular polysaccharides covalently bound to the diphtheria toxoid CRM197, which is highly immunogenic but non-toxic. This combination provokes a significantly more robust immune response by recruiting CRM197-specific type 2 helper T cells, which allow for immunoglobulin type switching (to produce non-IgM immunoglobulin) and production of memory B cells. Among other things, this results in mucosal immunity and eventual establishment of lifelong immunity after several exposures. This immune response is less robust than the response provoked by conjugated vaccines, which has several consequences. The vaccine is ineffective in children less than two years old, presumably due to their less mature immune systems. Non-responders are also common amongst older adults. Immunization is not lifelong, so individuals must be re-vaccinated every 5–6 years. Since no mucosal immunity is provoked, the vaccine does not affect carrier rates, promote herd immunity, or protect from upper or lower respiratory tract infections.

ADI has now developed antibody ELISA kits to determine the efficacy of pneumococcal vaccines in animal and humans. Antibody tests kits are available for non-conjugated vaccine **Pneumovax (23-serotypes); Conjugated (CRM197) vaccines Prevnar-7 (pCV-7), Prevant-10 (PCV-10/Synflorix) and Prevnar-13 (PCV-13).** The kits are designed to detect IgG and IgM antibody titers to the carbohydrates to the given serotypes present in the vaccines. Separate kits are available to detect antibodies to CRM197 as well. ADI can also provide any serotype antibody kit (single or a combination of serotypes such as 6A upon order). These kits are the first commercial kits for pneumococcal vaccine and should be highly useful to research and test the efficacy of the existing or the new vaccines.

### Streptococcus Pneumoniae Vaccines Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2781

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| Anti-S. Pneumococcal vaccine (Prevnar-7/PCV-7) ELISA kits (**7 serotypes**: 4,6B,9V,14,18C,19F, and 23F | Mouse | 560-100-07G | 560-105-07M |
| | Human | 560-110-07G | 560-115-07M |
| Anti-S. Pneumococcal vaccine (Synflorix/PCV-10) ELISA kits (**10 serotypes**: 1, 4, 5, 6B, 7F, 9V, 14, 18C, 19F, and 23F) | Mouse | 560-130-10G | 560-135-10M |
| | Human | 560-140-10G | 560-145-10M |
| Anti-S. Pneumococcal vaccine (PCV-13) ELISA kits (**13 serotypes** 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F) | Mouse | 560-160-13G | 560-165-13M |
| | Human | 560-170-13G | 560-175-13M |
| Anti-S. Pneumococcal vaccine (Pneumovax) ELISA kits (**23 serotypes**: 1, 2, 3, 4, 5, 6b, 7F, 8,9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19F, 19A, 20, 22F, 23F and 33F) | Mouse | 560-180-23G | 560-185-23M |
| | Human | 560-190-23G | 560-195-23M |
| Anti-**CRM197** (Diphtheria Toxin mutant) ELISA kits | Mouse | 940-220-DMG | 940-225-DMM |
| | Human | 940-200-DHG | 940-210-DHM |



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## Snake Anti-Venoms: Venoms, Antibodies and ELISA Kits

**Snake venom** is highly modified saliva containing zootoxins used by snakes to immobilize and digest prey or to serve as a defense mechanism against a potential predator or other threat. The venom produced by the snake's venom gland apparatus is delivered by an injection system of modified fangs that enable the venom to penetrate into the target. Venoms contain more than 20 different compounds, 100s proteins and polypeptides. A complex mixture of proteins, enzymes, and various other substances with toxic and lethal properties serves to immobilize the prey animal, enzymes play an important role in the digestion of prey, and various other substances are responsible for important but non-lethal biological effects. Some of the proteins in snake venom have very specific effects on various biological functions including blood coagulation, blood pressure regulation, and transmission of the nervous or muscular impulse and have been developed for use as pharmacological or diagnostic tools or even useful drugs. **Snakebite** is an injury caused by a bite from a snake, often resulting in puncture wounds inflicted by the animal's fangs and sometimes resulting in envenomation. **Envenomation** is the process by which venom is injected into animals and humans. Although the majority of snake species are non-venomous and typically kill their prey with constriction rather than venom, venomous snakes can be found on every continent except Antarctica. The number of human fatalities attributed to snake bites varies greatly by geographical area. Although deaths are relatively rare in Australia, Europe and North America, the morbidity and mortality associated with snake bites is a serious public health problem in many regions of the world, particularly in rural areas lacking medical facilities, and each year tens of thousands of people die from snake bites.

Indian Cobra (Naja-Naja) Indian Krait (B. Caeruleus) Russell's Viper (V. Russelli) Saw Scaled Viper (E. Carinatus)

**Antivenom** (or **antivenin or antivenene**) is a biological product used in the treatment of venomous bites or stings. Antivenom is created by milking venom from the desired snake, spider or insect. The venom is then diluted and injected into a horse, sheep or goat (**antivenom host**). The subject animal will undergo an immune response to the venom, producing antibodies against the venom's active molecule which can then be harvested from the animal's blood and used to treat envenomation. Antivenoms can be classified into **monovalent** (when they are effective against a given species' venom) or **polyvalent** (when they are effective against a range of species, or several different species at the same time). The first antivenom for snakes (called an **anti-ophidic serum**) was developed in 1895 against the **Indian Cobra (Naja naja**) by Albert Calmette, a French scientist at Pasteur Institute. Antivenoms for therapeutic use are often preserved as freeze-dried ampoules (powder), but some are available only in liquid form and must be kept refrigerated. The majority of antivenoms (including all snake antivenoms) are administered intravenously; however, stonefish and redback spider antivenoms can be given


**Horse** Polyvalent Antivenoms (antivenoms mix against 4 snake venoms) are available from Indian companies (Pics L to R: Serum Institute of India, Haffkine Inst., VINS Bio, and Bharat Serum) are made in horses and typically purified (Fab2). Supplied as lyophilized powder; used intravenously.

intramuscularly but are less effective. **Antivenoms bind to and neutralize the venom**, halting further damage, but do not reverse damage already done. Thus, they should be administered as soon as possible after the venom has been injected. Antivenom is typically the sole effective treatment for a life-threatening condition.

Diamond-back Rattlesnake (Crotalus atrox), Russell's Viper Copperhead (Vipera Russelli) Water Moccasin (Agkistrodon contortrix)

Antivenoms preparations are included in the **World Health Organization (WHO) List of Essential Medicines** and should be part of any primary health care package where snakebites occur. Currently, there is an urgent need to ensure availability of safe, effective and affordable antivenoms, particularly to those in developing countries and to improve the regulatory control over the manufacture, import and sale of antivenoms. Antivernom (whole antiserum from horse (equine), sheep (ovine), goat (caprine) or chicken) is usually purified to remove most serum proteins leaving mostly immunoglobulin (Ig's). Whole crude antibodies may also be subjected to antibody fragmentation to prepare only the **Fab2 fragments** of the antibodies to minimize exposure to the foreign proteins to minimize subsequent hypersensitivity reaction (anaphylaxis) or a delayed hypersensitivity (serum sickness). In the U.S. the only approved antivenom for pit viper (rattlesnake, copperhead and water moccasin) snakebite is based on a purified product made in sheep known as **CroFab** (Crotalidae Polyvalent Immune Fab (Ovine/Sheep)) is the only widely available antivenom indicated for the management of patients with minimal to moderate North American Crotalid envenomation (rattlesnake, water moccasin/cottonmouth and copperheads).


**Sheep** (Ovine) Polyvalent Antivernoms (mixture of antivenoms against the 3 snake venoms) are available from CroFab (USA) and Bioclon (Mexico) are made in **Sheep/Ovine** and typically purified (Fab2). Supplied as lyophilized powder; used intravenously.



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## Snake Anti-Venoms: Venoms, Antibodies and ELISA Kits

ADI has developed antibody ELISA kits to determine the efficacy of various antivenoms. These kits will not only identify the type but the biological potency of the antivenoms. It will also be possible to test the potency of the antivenoms at various stages of production, purification, vialing, lyophilization, and shelf life under various conditions and age. In addition, ADI has produced new antivenoms in rabbits and chicken to further promote research and test new vaccine or antivenom formulations. All ELISA kits are supplied with necessary controls and measure antivenom subtype antibody activity (IgG or IgM) against individual venom. Additional ELISA kits are available to establish residual concentrations of Horse or Sheep IgG-FC or whole IgG in antivenom formulations containing Fab.

### Antivenom Test Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2782

| Items | Description | Cat# |
|---|---|---|
| Horse Antivenoms (Indian) | Horse Anti-Cobra (Naja Naja) Antibody ELISA Kits | 570-100-CHG |
| | Horse Anti- Indian Krait (Bungarus Caeruleus) Antibody ELISA Kits | 570-110-KHG |
| | Horse Anti- Russell's Viper (Vipera Russelli) Antibody ELISA Kits | 570-120-RHG |
| | Horse Anti- Saw Scaled Viper (Echis Carinatus) Antibody ELISA Kits | 570-130-SHG |
| | Horse Anti-Common (Cobra, Crait, Russels and Saw scaled vipers) Antibody ELISA Kits | 570-140-XHG |
| Sheep/Ovine Antivenoms (N. America) | Sheep Anti-Diamond-back Rattlesnake (Crotalus atrox) Antibody ELISA Kits | 570-200-DSG |
| | Sheep Anti- Pit Viper Copperhead (Agkistrodon contortrix) Antibody ELISA Kits | 570-210-CSG |
| | Sheep Anti- Water Moccasin/cottonmouth pit viper (Agkistrodon piscivorus) Antibody ELISA Kits | 570-220-MSG |
| Horse | Sheep/Ovine Fab ELISA kit (measure total concn of antivenom Fab) | 7610-Fab |
| | Sheep/Ovine Antivenom Fc residue/contamination measurement ELISA | 7615-Fc |
| Sheep | Horse/Equine Fab ELISA kit (measure total concn of antivenom Fab) | 7710-Fab |
| | Horse/Equine Antivenom Fc residue/contamination measurement ELISA | 7715-Fc |
| Papain | Carica papaya Papain ELISA kit (for measuring papain residue/contaminant in therapeutics), 96 tests | 800-160-CPP |

### Antibody and other reagents for research use

| Item Description | Cat# |
|---|---|
| **Rabbit** Anti-Common Asian venom Antiserum (**Cobra, Crait, Russels and Saw scaled vipers**) | VNM11-S |
| **Chicken** Anti-Common venom Antiserum (**Cobra, Crait, Russels and Saw scaled vipers**) | VNM12-S |
| **Rabbit** Anti-Common N. American (**Diamondback, copperhead and Mocaccasin snakes**) venom antiserum | CATX15-S |
| **Chicken** Anti-Common N. American (**Diamondback, copperhead and Mocaccasin snakes**) venom antiserum | CATX16-S |
| **Rabbit** Anti-Diamondback Rattlesnake (**Crotalus atrox**) venom antiserum | CATX11-S |
| **Chicken** Anti-Diamond-back Rattlesnake (**Crotalus atrox**) venom antiserum | CATX12-S |
| Recombinant **Protein A+G-Agarose (Aff matrix)** for the purification of antivenom Fab | PRTAG25-AS-1 |
| Carica papaya Papain-Agarose aff matrix for the purification of IgG Fab/Fc | CPP16-AS-5 |
| Carica papaya Papain (>12 U/mg) for the purification of IgG Fab/Fc (1 g or bulk available) | CPP15-N-100 |



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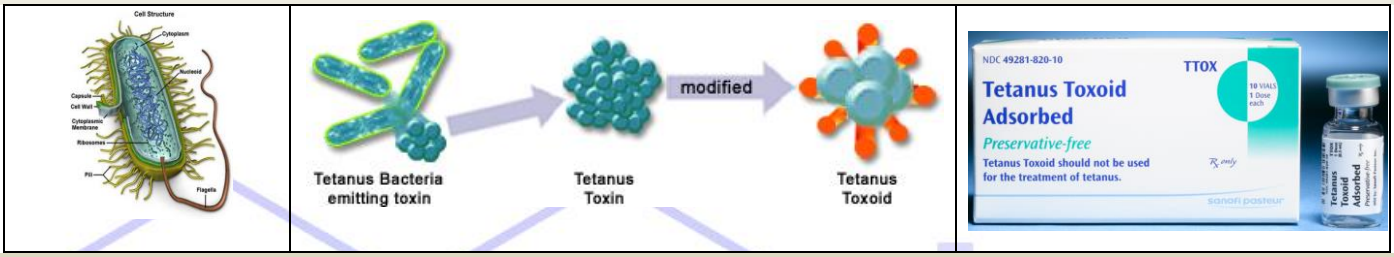
## Tetanus Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Tetanus, also called lockjaw, is a medical condition characterized by a prolonged contraction of skeletal muscle fibers. The primary symptoms are caused by tetanospasmin (also known as tetanus toxin); a neurotoxin produced by the Gram-positive, obligate anaerobic bacterium Clostridium tetani. Infection generally occurs through wound contamination and often involves a cut or deep puncture wound. As the infection progresses, muscle spasms develop in the jaw (thus the name "lockjaw") and elsewhere in the body. Infection can be prevented by proper immunization and by post-exposure prophylaxis. Nevertheless every year 400,000 - 800,000 persons die due to this infection. The majority of these persons live in under-developed countries. Tetanus begins when spores of Clostridium tetani enter damaged tissue. The spores transform into rod-shaped bacteria and produce the neurotoxin tetanospasmin. This toxin is inactive inside the bacteria, but when the bacteria die, it is released and activated by proteases. Active tetanospasmin is carried by retrograde axonal transport to the spinal cord and brain stem where it binds irreversibly to receptors at these sites. Ultimately, this produces the symptoms of the disease. Tetanus affects skeletal muscle, a type of striated muscle used in voluntary movement. The other type of striated muscle, cardiac or heart muscle cannot be tetanized because of its intrinsic electrical properties.




There are several **Tetanus vaccines** available that can be used alone or in combination with other diseases (multivalent). It is often necessary to monitor the efficacy of vaccines and determine the anti-Tetanus Ig levels in patients or for clinical trial using new formulation of vaccines. ADI's monkey anti- Tetanus Toxoid IgG ELISA kit is an immunoassay for the quantitative determination of IgG class antibodies against Tetanus **Trihibit** (DTAP/Hib), **ActHib** (Hib-PRP-T), **Daptacel** (DTAP), **Tripedia** (DTAP), **Td** (Adult), **DecavacTM** (tetanus/Diphtheria), **Adacel** (tetanus, Diphtheria, Acellular Pertussis), **DT** (Pediatric)-Sanofi Pasteur; **Pediarix** (DTAP/HepB/IPV), **Infanrix** (DTAP), **Boostrix** (Tetanus, Diphtheria, Acellular Pertussis)- GlaxoSmithKline..

ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes. ADI has also introduced industry's first ELISA for direct testing of Tetanus Toxoid adsorbed on Alum (for vaccine identification and testing).

### Tetanus Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2724

| ELISA Kit Description | Species | IgG Specific Cat# | IgM Specific Cat# | IgA Specific Cat# |
|---|---|---|---|---|
| **Tetanus Vaccine (Anti-Tetanus Toxoid) antibody ELISAs** | Human | 960-100-TTH | | |
| | Monkey | 930-410-TKG | | |
| | Mouse | 960-130-TMG | 960-140-TMM | 960-120-TMA |
| | Rabbit | 960-210-TRG | 930-220-TRM | |
| | G. Pig | 930-310-TGG | 930-320-TGM | |
| VacciGel Direct ELISA for the measurement of **Tetanus Toxoid (TTX) in Vaccines formulated in Alum**, 96 tests, Cat # VAC-TTX-300 | | | | |
| Tetanus Toxoid/Toxin (TTX) ELISA for the measurement **TTX in biological buffer**, cat # VAC-TTX-310 | | | | |

### Tetanus Vaccine Related Antibodies, Proteins and other Reagents

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2724

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Tetanus Toxoid (TTX) | RP-343 | Recombinant Anti-Tetanus Toxoid scFv IgG | Antibodies |
| | TTOX12-A | Rabbit Anti-C. tetani purified toxin IgG (tetanus shock toxin) | Antibodies |
| | TTOX13-A | Goat Anti-C. tetani purified toxin IgG (tetanus shock toxin) | Antibodies |
| | TTOX14-M | Monoclonal Anti-C. tetani purified toxin IgG (tetanus shock toxin) | Antibodies |
| | TTOX15-S | Anti-C. tetani purified toxin IgG (tetanus shock toxin) | Antibodies |

***Please contact ADI for custom testing of animal and human samples.***



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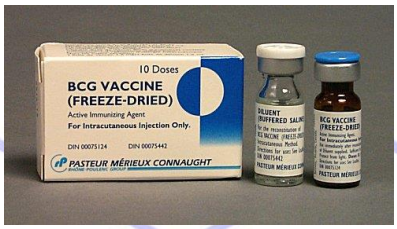
## Tuberculosis Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

**Tuberculosis**, MTB, or TB (short for tubercle bacillus) is a common, and in many cases lethal, infectious disease caused by various strains of mycobacteria, usually *Mycobacterium tuberculosis*. The infectious agents of tuberculosis are acid-resistant rod-like bacteria of the family Mycobacteriaceae, genus Mycobacterium. The organism was detected by Robert Koch in 1882. Mycobacterioses (tuberculosis, leprosy, atypical mycobacterioses, paratuberculosis, and perhaps Crohn's Disease) are diseases of men and animals with the largest diffusion on earth. One third of the world's population is thought to have been infected with M. tuberculosis, with new infections occurring at a rate of about one per second. TB killed 1.4 million people in 2010. Tuberculosis typically attacks the lungs, but can also affect other parts of the body. It is spread through the air when people who have an active TB infection cough, sneeze, or otherwise transmit their saliva through the air. Most infections are asymptomatic and latent, but about one in ten latent infections eventually progresses to active disease which, if left untreated, kills more than 50% of those so infected. Individuals with HIV are at risk for infection by tuberculosis due to their impaired immune system. The two antibiotics most commonly used are isoniazid and rifampicin but antibiotic resistance is a serious concern. Treatment of TB uses antibiotics to kill the bacteria. Drug-resistant TB is a serious public health issue in many developing countries, as its treatment is longer and requires more expensive drugs.


The main cause of TB is Mycobacterium tuberculosis, a small, aerobic, nonmotile bacillus. The high lipid content of this pathogen accounts for many of its unique clinical characteristics. If a Gram stain is performed, MTB either stains very weakly "Gram-positive" or does not retain dye as a result of the high lipid and mycolic acid content of its cell wall. The only currently available vaccine as of 2012 is **bacillus Calmette–Guérin (BCG with live attenuated bacteria)** which, while it is effective against disseminated disease in childhood, confers inconsistent protection against contracting pulmonary TB. Nevertheless, it is the most widely used vaccine worldwide, with more than 90% of all children being vaccinated. A number of **new TB vaccines** are currently in phase I and II clinical trials. **MVA85A** (modified vaccinia Ankara 85A, Oxford University) is **a subunit vaccine to BCG.** This vaccine produces higher levels of long-lasting cellular immunity when used together with the old TB vaccine called BCG. It uses the attenuated MVA as a vaccine delivery platform to present **antigen 85A** to the immune system. The other strategy is using genetically modified vaccinia virus.

Mycobacterium tuberculosis (H37Rv strain) has circular chromosomes of about 4,200,000 nucleotides long and ~4000 gene.

The closely related proteins of the **antigen 85 complex**, initially identified in Mycobacterium bovis BCG by crossed immunoelectrophoresis, are major secreted products of mycobacteria growing in synthetic media. Three closely related components, termed antigens 85A, 85B, and 85C, have been demonstrated in M. bovis BCG and M. tuberculosis. Although the antigens are genetically distinct, they are highly homologous and cross-react with polyclonal and monoclonal antibodies raised against individual components. The genes encoding **antigen 85A**, a 32-kDa protein also referred to as **P32**, have been cloned from **M. bovis BCG and M. tuberculosis**, while genes for **85B**, a 30- to 31-kDa protein variously termed MPB59 or alpha antigen, have been isolated from M. bovis BCG, Mycobacterium kansasii, and Mycobacterium leprae. Sequence analysis revealed 85% identity between the M. bovis BCG 85A and 85B components in the amino acid sequence of the mature secreted proteins. Many mycobacterial antigens have been identified, such as 71, 65, 38, 23, 19, 16, 14 and 12-kDa proteins. The 38-kDa protein is an immunodominant lipoprotein antigen isolated as a component of antigen 5 by affinity chromatography, and is specific only for the M. tuberculosis complex. It is the most extensively studied antigen. The 16-kDa antigen is an immunodominant antigen, frequently called 14 kDa, related to the family of low molecular weight heat-shock proteins. This antigen contains B-cell epitopes specific for the M. tuberculosis complex.

The only available procedure in addition to the skin tuberculin test was direct microscopic identification of the dyed bacteria in sputum. Recently specific antigens have been prepared either by purification of natural material or by recombinant methods.

ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### Tuberculosis vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2749

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# | Antibody Type IgA Cat# |
|---|---|---|---|---|
| Mycobacterium **Tuberculosis Vaccine** Antibody ELISA kit | Human | 990-110-THG | 990-120-THM | 990-100-THA |
| | Mouse | 990-210-TMG | 990-220-TMM | |
| | Rabbit | 990-310-TRG | 990-320-TRM | |
| | Monkey | 990-400-MTG | 990-410-MTM | |
| M. Tuberculosis **Vaccine 6kDa/ESAT-6** antibody ELISA kit | Mouse | 990-230-06G | 990-235-06M | |
| M. Tuberculosis **vaccine 16kDa/Hspx** antibody ELISA kit | Mouse | 990-240-16G | 990-245-16M | |
| M. Tuberculosis **MVA85A vaccine** antibody (38kda/Ag85b) ELISA kit | Mouse | 990-250-38G | 990-255-38M | |
| | Human | 990-260-38G | 990-265-38M | |

### Tuberculosis vaccine Related Antibodies, Proteins and other Reagents

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2749

| Items | Catalog# | Product Description | Product Type |
|---|---|---|---|



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| | | | |
|---|---|---|---|
| M. Tuberculosis Ag85 | Ag85A111-P | M. tuberculosis Protein Ag85A T-cell immunodominant CD8 peptide, MHC class I H-2Ld-restricted epitope (LTSELPGWLQANRHVKPTGS, WT: 2191.5) | Pure Peptide |
| | Ag85A112-P | M. tuberculosis Protein Ag85A T-cell immunodominant CD8 peptide, MHC class I H-2Ld-restricted epitope (MPVGGQSST, MW:863) | Pure Peptide |
| | Ag85B211-P | M. tuberculosis Protein Ag85b (199-207) HLA-A2 binding peptide (KLVANNTRL) | Pure Peptide |
| | MTB381-C | Recombinant purified M. tuberculosis antigen 38kDa/Ag85B control for Western | Western control |
| | MTB381-M | Monoclonal Anti-Mycobacterium tuberculosis antigen 38kDa/Ag85B IgG | Antibodies |
| | MTB38-R | Recombinant purified (E. coli) Mycobacterium tuberculosis antigen (38kDa/Ag85B) | Recomb. Protein |
| | MTB6381-S | Anti-M. Tuberculosis antigens (6Kda/ESAT+16kDa+38KDa/Ag85b proteins antiserum | whole BCG vaccine |
| | RP-999 | Recomb. M. tuberculosis major secretory protein Antigen 85B (38kda Antigen, Ag85b) | Pure protein |
| MTB16 kda/Hspx | MTB161-C | Recombinant purified M. tuberculosis antigen (16kDa/Hspx) control for Western | Western control |
| | MTB161-M | Monoclonal Anti-Mycobacterium tuberculosis antigen (16kDa/Hspx) IgG | Antibodies |
| | MTB16-R | Recombinant purified (E. coli) Mycobacterium tuberculosis antigen (16kDa/Hspx) | Recomb. Protein |
| | MTB161-C | Recombinant purified M. tuberculosis antigen (16kDa/Hspx) control for Western | Western control |
| | MTB161-M | Monoclonal Anti-Mycobacterium tuberculosis antigen (16kDa/Hspx) IgG | Antibodies |
| | MTB16-R | Recombinant purified (E. coli) Mycobacterium tuberculosis antigen (16kDa/Hspx) | Recomb. Protein |
| MTB6kda ESAT-6 | MTB061-C | Recombinant purified M. tuberculosis antigen (6kDa/ESAT-6) control for Western | Western control |
| | MTB061-M | Monoclonal Anti-Mycobacterium tuberculosis antigen (6kDa/ESAT-6) IgG | Antibodies |
| | MTB06-R | Recombinant purified (E. coli) Mycobacterium tuberculosis antigen (6kDa/ESAT-6) | Recomb. Protein |
| | MTB161-C | Recombinant purified M. tuberculosis antigen (16kDa/Hspx) control for Western | Western control |
| | MTB161-M | Monoclonal Anti-Mycobacterium tuberculosis antigen (16kDa/Hspx) IgG | Antibodies |
| | MTB16-R | Recombinant purified (E. coli) Mycobacterium tuberculosis antigen (16kDa/Hspx) | Recomb. Protein |
| | RP-977 | Recombinant purified ESAT-6 (6 kDa early secretory antigen of T cells; M. Tuberculosis) | Pure protein |
| | RP-977-100 | Recombinant purified ESAT-6 (6 kDa early secretory antigen of T cells; M. uberculosis) | Pure protein |
| BCG vaccine | BCG11-S | Rabbit Anti-Bacillus calemette-Guerin (BCG) proteins (M. bovis) antiserum | whole BCG vaccin |
| CFP10 | CFP101-M | Monoclonal Anti-M. tuberculosis 10 Kda cultural filtrate protein (CFP10) IgG | Antibodies |
| | CFP151-P | Culture filtrate protein 10 (CFP10/M. tuberculosis) (71-85) antigenic peptide (EISTNIRQAGVQYSR, MW:1721.9) | Pure Peptide |
| Hsp/hspx | HSP651-C | Recombinant purified M. tuberculosis Heat Shock Protein 65 (hsp65/groEL-2/Cpn60-2) control for Western | Western control |
| | HSP651-M | Monoclonal Anti-M. tuberculosis Heat Shock Protein 65 (hsp65/groEL-2/Cpn60-2) IgG | Antibodies |
| | HSP651-P | Heat shock protein (M. leprae HSP65; 417-429) specific P62 peptide (LLQAAPALDKLKL, MW:1393.7) | Pure Peptide |
| | HSP652-P | Heat shock protein (M. leprae/M. tuberculosis HSP65; 417-429) P38 peptide (AGGGVTLLQAAPALD, MW:1353.5) | Pure Peptide |
| | HSP653-P | Heat shock protein (M. leprae HSP65; 343-355) P61 peptide (RVAQIRTEIENSD, MW:1530.7) | Pure Peptide |
| | HSP654-P | Heat shock protein (M. bovis HSP65; 243-255) indicator peptide in HLA-DQ2 binding assays (KPLLIIAEDVEGEY, MW:1588.8) | Pure Peptide |
| | HSP701-C | Recombinant purified M. tuberculosis Heat Shock Protein 70 (hsp70/Dnak/ML2496) control for Western | Western control |
| | HSP701-M | Monoclonal Anti-M. tuberculosis Heat Shock Protein 70 (hsp70/Dnak/ML2496) IgG | Antibodies |
| | HSP701-M | Monoclonal Anti-M. tuberculosis Heat Shock Protein 70 (hsp70/Dnak/ML2496) IgG | Antibodies |
| | RP-627 | Recombinant purified Mycobacterium Tuberculosis Heat Shock Protein 65 (hsp65/groEL-2/Cpn60-2) | Pure protein |
| | RP-628 | Recombinant purified Mycobacterium Tuberculosis Heat Shock Protein 70 (hsp70/Dnak/ML2496) | Pure protein |
| PPD | PPD11-A | Rabbit Anti-purified protein derivative (PPD and most proteins of M. tuberculosis) IgG | Antibodies |
| | PPD11-BTN | Rabbit Anti-purified protein derivative (PPD and most proteins of M. tuberculosis) IgG-biotin conjugate | Antibodies |
| | PPD11-FITC | Rabbit Anti-purified protein derivative (PPD and most proteins of M. tuberculosis) IgG-FITC conjugate | Antibodies |
| M. Tuberculosis | RV17341-M | Monoclonal Anti-M. tuberculosis Rv1734 dormant protein from H37Rv strain IgG | Antibodies |
| | RV20311M | Monoclonal Anti-M. tuberculosis Rv2031 dormant protein from H37Rv strain IgG | Antibodies |
| | RV26231-M | Monoclonal Anti-M. tuberculosis Rv2623 dormant protein from H37Rv strain IgG | Antibodies |
| | UBQ151-P | Ubiquitin 2 (Ub2, 65-76) peptide with anti-M. tuberculosis activity (STLHLVLRLRGG) | Pure Peptide |



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## VacciGel™ ELISA for direct identification and quantitation of vaccines formulated in Alum

*VacciGel™ series ELISAs are an innovative and industry's first test for the direct identification and measurement of vaccine components adsorbed on Alum adjuvants. The proprietary methods require NO ANTIGEN ELUTION or harsh treatment of the Alum gel. The assay can be completed in ~2 hrs at room temp. VacciGel™ series is available for Hepatitis B, Diphtheria, Tetanus, Pertussis, Rabies, and HCG (anti-fertility) vaccines.*

Currently, the only adjuvants approved for human vaccine are aluminum containing compounds, including aluminum hydroxide (Al(OH)3) or Alhydrogel®, aluminum phosphate (AlPO4), and potassium aluminum sulfate (KAl(SO4)2·12H2O) or alum. To ensure vaccine quality, regulatory authorities require the manufacturer to measure vaccine content in the final product. World Health Organization (WHO) recommends that at least 80% of the tetanus vaccine be adsorbed to the gel. In particular, it is essential to determine the amount as well as the identity and integrity of the antigens bound to aluminum containing adjuvants following formulation. Aluminum-based gels are typically fibrous or beaded in suspension. The presence of aggregates, turbidity, flocculent gels or beads in solution prevents direct quantitation of protein content in formulations using assays such as Lowry, BCA, or Bradford protein assay, not to mention that these assays are all non-specific and low in sensitivity. Alhydrogel formulations also do not allow complete dissolution or extraction making it very difficult to know the identity of the vaccines or know the amount of the protein after their dispensing. There have been occasions when Tetanus vaccine has been mislabeled, intentionally or unintentionally, with the HCG-vaccine (anti-fertility). Therefore, there is an urgent need for an assay that can quickly identify and measure the vaccine contents without any extraction or dissolution. The US licensed vaccines that contain aluminum adjuvants are: DTP (diphtheria-tetanus-pertussis vaccine), DTaP (diphtheria-tetanus-acellular pertussis vaccine); Some but not all Hib (Haemophilus influenzae type b) conjugate vaccines; Pneumococcal conjugate vaccine; Hepatitis B vaccines, All combination DTaP, Tdap, Hib, or Hepatitis B vaccines, Hepatitis A vaccines; Human Papillomavirus (HPV) vaccine; Anthrax vaccine; Rabies vaccine.

- What are these vaccines?
- Is this Tetanus or anti-fertility vaccine?
- Are the vaccines still potent and have the expected vaccine contents?

**Find out with VacciGel™ ELISAs to identify and measure the vaccine formulated in gels**

**VacciGel™ Direct ELISA Features**

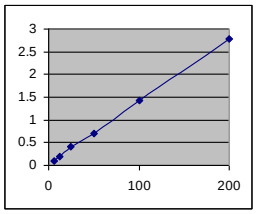
- Direct testing of vaccines formulated in Aluminum gels (Alhydrogels, Adjuphos or Alum)
- High sensitivity ELISA allow testing at 1:10-1:100 diluted vaccines
- No complicated protocol, instruments or extraction procedure that may destroy the vaccines
- Room temp assay in < 2 hrs. Stability ~12 months
- Use **VacciGel™** ELISA for routine manufacturing, Vaccine identification, and antigen dose at the time of manufacture and lot testing; Shelf life etc.
- **VacciGel™** ELISA available for Hepatitis B, Diphtheria, Tetanus, Pertussis, Rabies, and HCG (anti-fertility) vaccines

This kit For in vitro research use only.

## VacciGel™ direct ELISA for the detection and measurement of Hepatitis B vaccine (HBSAg) adsorbed onto the Alhydrogel, Cat #VAC-HBS-100

Merck Recombivax

HBsAg @ 10 µg/ml




HBsAg in Alhydrogel (ng/ml)

**VacciGel™ Direct ELISA for Hepatitis B Vaccine #VAC-HBS-100**

- Standards: Recombinant HBsAg adsorbed on Alhydrogel (Aluminum hydroxide); 12.5-200 ng/ml
- Standards calibrated to Merck Recombivax
- Vaccine sample: 100 ul (1:100-1:500 diluted)
- Assay Time: 105 min at room temp (3 incubations)
- Sensitivity: HBsAg ~10 ng/ml vaccine
- Standard vaccine contains HBsAg @ =10 µg/ml

**Suitable for Hepatitis B vaccines (monovalent or multivalent)**:

**Merck vaccines**: Comvax (HepB/Hib), Recombivax HB (Hep B), PedvaxHib (Hib-PRP-OMP)

**GlaxoSmithKline vaccines**- Engerix-BPEd/Adol (HepB Ped/Adol), Engerix-B for adults (HepB), Pediarix (DTAP/HepB/IPV

**WyethLederle vaccines**-; Trihibit (DTAP/Hib), ActHib (Hib-PRP-T) - Sanofi Pasteur; HibTiter (Hib-Hboc)



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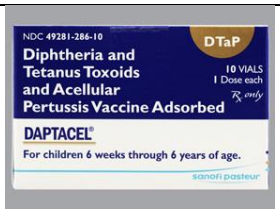
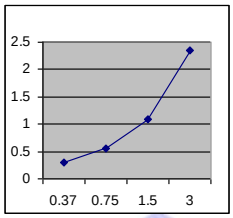
## VacciGel™ direct ELISA for the detection and measurement of Diphtheria Vaccine (Diphtheria Toxoid adsorbed onto the Adjuphos gel, Cat #VAC-DTX-200




DTX (Lf/ml adjuphos)

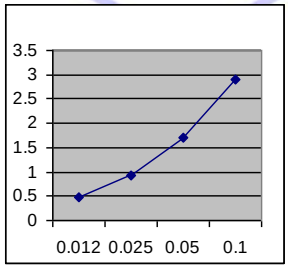
**VacciGel™ Direct ELISA for Diphtheria Vaccine #VAC-DTX-200**

- Standards: DTX adsorbed on Adjuphos gel (Aluminum phosphate AlPO4); 0.1-3 Lf/ml
- Standards calibrated to Sanofi Triple vaccine Daptacel
- Vaccine sample: 100 ul (1:10-1:100 diluted)
- Assay Time: 105 min at room temp (3 incubations)
- Sensitivity: Diphtheria Toxoid ~0.1 Lf/ml vaccine (standard vaccine
- Standard Daptacel vaccine contains Diphtheria Toxoid @ =30 Lf/ml

**Suitable for Diphtheria vaccines (monovalent or multivalent)**:

**GlaxoSmithKline**-Pediarix (DTAP/HepB/IPV), Infanrix (DTAP), Boostrix (Tetanus, Diphtheria, Acellular Pertussis –
**Sanofi Pasteur**-Trihibit (DTAP/Hib), Daptacel (DTAP), Tripedia (DTAP),Td (Adult)- Adacel (tetanus, Diphtheria, Acellular Pertussis), DecavacTM (tetanus/Diphtheria)
**Aventis Pasteur**-DT (Pediatric)

## VacciGel™ direct ELISA for the detection and measurement of Tetanus Vaccine (Tetanus Toxoid adsorbed onto the Adjuphos gel, Cat #VAC-TTX-300


Tetanus Toxoid (Lf/ml Adjuphos)

**VacciGel™ Direct ELISA for Tetanus Vaccine #VAC-TTX-300**

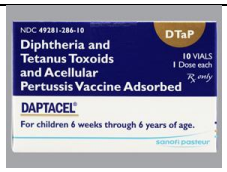
- Standards: Tetanus Toxoid adsorbed on Adjuphos gel (Aluminum phosphate AlPO4); 0.001-1 Lf/ml
- Standards calibrated to Sanofi Triple vaccine Daptacel
- Vaccine sample: 100 ul (1:100-1:1000 diluted)
- Assay Time: 105 min at room temp (3 incubations)
- Sensitivity: Tetanus Toxoid ~0.001 Lf/ml vaccine
- Standard Daptacel vaccine contains TTX @ =10 Lf/ml

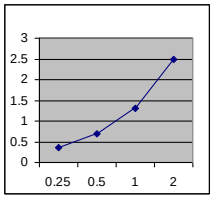
**Suitable for Tetanus vaccines (monovalent or multivalent)**:

**GlaxoSmithKline**-Pediarix (DTAP/HepB/IPV), Infanrix (DTAP), Boostrix (Tetanus, Diphtheria, Acellular Pertussis

**Sanofi Pasteur**-Trihibit (DTAP/Hib), Daptacel (DTAP), Tripedia (DTAP),Td (Adult)- Adacel (tetanus, Diphtheria, Acellular Pertussis), DecavacTM (tetanus/Diphtheria)
**Aventis Pasteur**-DT (Pediatric)

## VacciGel™ direct ELISA for the detection and measurement of Pertussis Vaccine (Pertussis Toxoid adsorbed onto the Adjuphos gel, Cat #VAC-PTX-400




PTX (ug/ml Adjuphos)

**VacciGel™ Direct ELISA for Pertussis Vaccine #VAC-PTX-300**

- Standards: Tetanus Toxoid adsorbed on Adjuphos gel (Aluminum phosphate AlPO4); 0.001-1 Lf/ml
- Standards calibrated to Sanofi Triple vaccine Daptacel
- Vaccine sample: 100 ul (1:100-1:1000 diluted)
- Assay Time: 105 min at room temp (3 incubations)
- Sensitivity: Tetanus Toxoid ~0.001 Lf/ml vaccine

**Suitable for Pertussis vaccines (monovalent or multivalent)**:

**GlaxoSmithKline**-Pediarix (DTAP/HepB/IPV), Infanrix (DTAP), Boostrix (Tetanus, Diphtheria, Acellular Pertussis –
**Sanofi Pasteur**-Trihibit (DTAP/Hib), Daptacel (DTAP), Tripedia (DTAP),Td (Adult)- Adacel (tetanus, Diphtheria, Acellular Pertussis), DecavacTM (tetanus/Diphtheria)
**Aventis Pasteur**-DT (Pediatric)



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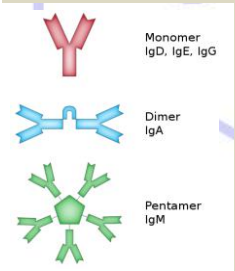
The **immune system** is a system of biological structures and processes within an organism that protects against disease. To function properly, an immune system must detect a wide variety of agents, from viruses to parasitic worms, and distinguish them from the organism's own healthy tissue. If a pathogen breaches these barriers, the **innate immune system** provides an immediate, but non-specific response. Innate immune systems are found in all plants and animals. If pathogens successfully evade the innate response, vertebrates possess a second layer of protection, the **adaptive immune system**, which is activated by the innate response. Here, the immune system adapts its response during an infection to improve its recognition of the pathogen. This improved response is then retained after the pathogen has been eliminated, in the form of an **immunological memory**, and allows the adaptive immune system to mount faster and stronger attacks each time this pathogen is encountered. Disorders of the immune system can result in **autoimmune diseases**, inflammatory diseases and cancer. White blood cells or **immune cells** are cells of the immune system involved in defending the body against both infectious disease and foreign materials. **Immunoglobulins (Ig's) or antibodies** are major components of the immune system. Antibodies are secreted by a type of white blood cell called a plasma cell. Activated B cells differentiate into either antibody-producing cells called plasma cells that secrete soluble antibody or memory cells that survive in the body for years afterward in order to allow the immune system to remember an antigen and respond faster upon future exposures. **T helper cells** (Th cells) are a sub-group of lymphocytes that play an important role in the immune system, particularly in the adaptive immune system. They are essential in **B cell antibody class switching**, in the activation and growth of **cytotoxic T cells**, and in maximizing bactericidal activity of phagocytes such as macrophages.




Five different antibody isotypes (IgA, IgD, IgE, IgG, and IgM) are known in mammals. IgG subclasses are defined by the type of heavy chains. Antibody isotypes perform different roles and help direct the appropriate immune response for each different type of foreign object they encounter. Immunoglobulin class switching recombination (CSR)) is a biological mechanism that changes a B cell's production of antibody from one class to another. There are four IgG subclasses in humans, named in order of their abundance in serum: IgG1 (66%), IgG2 (23%), IgG3 (7%), and IgG4 (4%). The IgG2 in mouse is subdivided into IgG2a and IgG2b. Antibodies can occur in two physical forms, a soluble form that is secreted from the cell, and a membrane-bound form that is attached to the surface of a B cell and is referred to as the B cell receptor (BCR). The basic functional unit of each antibody is an immunoglobulin (Ig) monomer; secreted antibodies can also be dimeric with two Ig units as with IgA or pentameric IgM. Antibodies are ~150 kDa globular plasma proteins containing two identical class γ heavy chains of about 50 kDa and two identical light chains of about 25 kDa. Each IgG has two antigen binding sites. Representing approximately 75% of serum immunoglobulin in humans, IgG is the most abundant antibody isotype found in the circulation allowing it to control infection of body tissues. By binding many kinds of pathogen—representing viruses, bacteria, and fungi—IgG protects the body from infection. It does this via several immune mechanisms: IgG-mediated binding of pathogens causes their immobilization and binding together via agglutination; IgG coating of pathogen surfaces allows their recognition and ingestion by phagocytic immune cells; IgG activates the classical pathway of the complement system, a cascade of immune protein production that results in pathogen elimination; IgG binds and neutralizes toxins. IgG also plays an important role in **antibody-dependent cell-mediated cytotoxicity (ADCC)**. It is associated with **Type II and Type III Hypersensitivity**. IgG antibodies are generated following class switching and maturation of the antibody response and thus participate predominantly in the secondary immune response. It is the only isotype that can pass through the human placenta, thereby providing protection to the fetus in utero.

The functional activity of antibodies also depends on Ig's isotypes. IgM is the first antigen receptor (BCR) made during B cell development and the first antibody secreted during an immune response. Four subisotypes of **IgG** in humans have somewhat varied biological functions. IgG is made later in a primary response than **IgM**, but it is produced more rapidly in a memory response. IgG is the predominant serum antibody with the longest half-life. **IgA** is present in serum and predominates in mucosal secretions: breast milk, saliva, tears, and respiratory, digestive, and genital tract mucus. Secretory IgA provides a first-line defense where pathogens enter the body. More IgA is made than any other isotype. IgG1 and IgG3 are most effective in complement binding and activation, and IgG2 may contribute to protection against disease. Furthermore, affinity differences have been found in antibodies with similar antigen-binding specificities but different IgG isotypes. IgG1 and IgG3 are mainly directed at protein antigens, whereas IgG2 is predominantly found after vaccination with polysaccharide antigens in adults. **IgE** produced in response to parasites and to allergens. Immunoglobulin D (**IgD**) is an antibody isotype that makes up about 1% of proteins in the plasma membranes of immature B-lymphocytes where it is usually co-expressed with another cell surface antibody called IgM. IgD is also produced in a secreted form that is found in very small amounts in blood serum.

T cell cytokines are responsible for class switching. In the mouse:
**Th1 response** mediated by macrophage (Cytokines: IFN-γ/IL-10/IL-2): Isotypes (IgG2a)
**Th2 response** (Cytokines: IL-4, IL-5/6/10/13): Isotypes (IgG1, IgE)
**Treg response** (Cytokines: TGFb) Isotypes (IgG2b, IgA)

Antibody response or isotype of an antibody is also influenced by the type of antigen (protein, bacteria, virus, or small molecule) immunization routes (intravenous, subcutaneous, intradermal etc), antigen dose and duration (amount of the antigen and frequency of exposure, and multiplicity of immunization) and the presence of other agents in the antigens (proteins, DNA, and adjuvants etc). Adjuvants (Squalene, Alhydrogel, Incomplete Freunds adjuvant) primarily invoke Th2 response whereas TLR5 agonist (Flagellin, CpG ODNs type A/B/C, Poly I/C or dsDNA induce Th1 reponse.

A **vaccine** is a biological preparation that improves immunity to a particular disease. A vaccine typically contains an agent that resembles a disease-causing microorganism, and is often made from weakened or killed forms of the microbe (bacteria or virus), its toxins or one of its antigenic proteins. The immune system recognizes vaccine agents as foreign, destroys them, and "remembers" them. When the diseases causing or virulent version of an agent is encountered, the body recognizes the antigenic proteins on the bacteria or virus, and thus is prepared to respond, by (1) neutralizing the target agent before it can enter cells, and (2) by recognizing and destroying infected cells before that agent can multiply to vast numbers. This is part of the **adaptive (or acquired) immune response**. This process of acquired immunity is the basis of **vaccination**. Success of a given vaccine depends upon its ability to produce high affinity, neutralizing antibodies with minimum exposure of the active vaccine ingredients (whole cells or bacteria or purified protein) and to provide long-term immunity. Therefore, it is essential to study how antibody response and isotype are influenced by a given agent. **Ovalbumin (OVA** also used as allergenic antigen, **Bovine serum albumin** (**BSA**, used model protein antigen) and **Dinitrophenol** (**DNP**, as hapten or small molecule antigen) have been used as "model antigens" to study antibody response. In addition, these model antigens have also served to examine the immune-status of an individual or animal during a disease or as a result of exposure to a given drug.

ADI has developed ELISA kits for various model antigens (ovalbumin, BSA, DNP, and DNA) to study basic mechanism of isotype switching and factors affecting it.

## Vaccine Model Antigens (Ovalbumin, DNP, and DNA) ELISA Kits and Reagents

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

| ELISA type | Antibody Type | Mouse Cat# | Rat Cat# | Monkey Cat# | Rabbit Cat# |
|---|---|---|---|---|---|
| Anti-Ovalbumin (**OVA**) Antibody ELISA Kits | Total Ig's(G+A+M) | 600-100-OGG | 610-100-OGG | 670-130-OVM | 620-100-OGG |
| | IgG | 600-105-OGG | | | |
| | IgG1 | 600-110-OG1 | | | |
| | IgG2a | 600-120-O2A | | | |
| | IgG2b | 600-130-O2B | | | |
| | IgG3 | 600-140-OG3 | | | |
| | IgA | 600-150-OGA | | | |
| | IgM | 600-170-OGM | 610-120-OGM | | |
| | IgE | 600-165-OGE | 610-110-OGE | | |
| Anti-Dinitrophenol (**DNP**) Antibody ELISA Kits | Ig's (G+A+M) | 640-200-DGG | 650-110-DGG | | |
| | IgG | 640-210-DGG | | | |
| | IgM | 640-220-DGM | 650-120-DGE | | |
| | IgE | 640-200-DGE | 650-100-DGM | | |
| Anti-**dsDNA** Antibody ELISA | Total Ig's(G+A+M) | 5110 | | 670-100-DNM | |
| | IgG | 5120 | 650-130-DDN | | |
| | IgG1 | 5120-1 | | | |
| | IgG2a | 5120-2a | | | |
| | IgG2b | 5120-2b | | | |
| | IgG3 | 5120-3 | | | |
| | IgA | 5120-A | | | |
| | IgM | 5130 | | | |
| | IgE | 5120-E | | | |
| Anti-**ssDNA** Antibody ELISA | Ig's (G+A+M) | 5310 | | | |
| | IgG | 5320 | 650-330-DSN | | |
| | IgM | 5330 | | | |

## Vaccine Model Antigens (Ovalbumin, DNP, and DNA) Antibodies and Reagents

| Items | Catalog# | ProdDescription | ProductType |
|---|---|---|---|
| DNP | DNP11-S | Mouse Anti-Dinitrophenyl (DNP) antiserum | Antiserum |
| | DNP13-A | Rabbit Anti-Dinitrophenyl (DNP) aff pure | Antibodies |
| | DNP14-M | Mouse Anti-Dinitrophenyl (DNP IgE, aff pure | Antibodies |
| | DNP15-M | Mouse Anti-Dinitrophenyl (DNP IgG1, aff pure | Antibodies |
| | DNP15-MW | Mouse Anti-Dinitrophenyl (DNP IgG1, aff pure (w/o azide) | Antibodies |
| | DNP25-N-10 | Dinitrophenyl (DNP)-KLH protein Conjugate | Pure Protein |
| | DNP35-AS-1 | Dinitrophenyl (DNP)-BSA protein Conjugated to Agarose (affinity matrix) | Pure Protein |
| | DNP35-BTN-10 | Dinitrophenyl (DNP)-Biotin-BSA protein Conjugate | Pure Protein |
| | DNP35-N-10 | Dinitrophenyl (DNP)-BSA protein Conjugate | Pure Protein |
| | DNP55-N-10 | Dinitrophenyl (DNP)-Ovalbumin (OVA) protein Conjugate | Pure Protein |
| | DNP65-N-10 | Dinitrophenyl (DNP)-human serum albumin (HSA) protein Conjugate | Pure Protein |
| | DNP70-N-10 | Dinitrophenyl (DNP)-Chicken Gamma Globulin (CGG) Conjugate | Pure Protein |
| | DNP75-N-10 | Dinitrophenyl (DNP)-rabbit serum albumin (RSA) protein Conjugate | Pure Protein |
| | DNP80-N-10 | Dinitrophenyl (DNP)-Sheep serum albumin (SSA) protein Conjugate | Pure Protein |
| | DNP85-N-10 | Dinitrophenyl (DNP)-Lipopolysaccharide (LPS) Conjugate | Pure Protein |
| | DNP90-N-1 | Dinitrophenol (2,4-DNP), >98% pure (protein analyses grade) | Pure Protein |
| Ovalbumin (OVA) | CAF11-S | Chicken Allantoic fluid (SPF eggs) tested –ve for various chicken viruses | Kit |
| | CSNC11-S | Chicken serum (SPF) tested –ve for various chicken viruses | Kit |
| | GSH15-N-100 | Glutathione-Ovalbumin conjugate for ELISA | Pure protein |
| | GSH16-N-100 | Glutathione-Bovine serum albumin (BSA) conjugate for ELISA | Pure protein |
| | NITT16-N | Nitrated egg ovalbumin protein for ELISA or controls (in PBS) | Pure Protein |
| | OVA11-A | Rabbit Anti-chicken Egg Ovalbumin (OVA) IgG, aff pure | Antibodies |
| | OVA11-AS | Anti-chicken egg ovalbumin IgG-agarose (aff matrix) | Aff support |
| | OVA11-S | Rabbit Anti-chicken Egg Ovalbumin IgG | Antiserum |
| | OVA13-M | Monoclonal Anti-chicken Egg Ovalbumin ascites (IgG1) | Antibodies |
| | OVA14-S | Mouse polyclonal Anti-chicken Egg Ovalbumin ascites (IgA+G+M+E) | Antiserum |
| | OVA15-AS | Chicken Egg Ovalbumin-agarose (aff matrix) to remove anti-ovalbumin Ig's | Aff support |
| | OVA15-N-1000 | Chicken egg ovalbumin protein (ELISA, antigen, allergy grade) | Rec. Protein |
| | OVA16-S | Rat polyclonal Anti-chicken Egg Ovalbumin serum (IgA+G+M+E) | Antiserum |



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# Vaccinia Virus Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

Vaccinia virus (VACV or VV) is a large, complex, enveloped virus belonging to the poxvirus family. It has a linear, double-stranded DNA genome approximately 190 kbp in length, and which encodes for approximately 250 genes. Vaccinia virus is a big mystery in virology. It is not known whether vaccinia virus is the product of genetic recombination, or if it is a species derived from cowpox virus or Variola virus by prolonged serial passage, or if it is the living representative of a now extinct virus. Vaccinia virus was used for smallpox vaccination via inoculation into the superficial layers of the skin of the upper arm. However, with the eradication of smallpox, routine vaccination with Vaccinia virus has ceased. Recent interest in vaccinia has focused on its possible usage as a vector for immunization against other viruses. Much less virulent strains than those used for vaccination against smallpox are being developed for use as vectors, in hopes of reducing the likelihood of the development of serious complications previously seen with smallpox vaccination.

A Vaccinia virus infection is very mild and is typically asymptomatic in healthy individuals, but it may cause a mild rash and fever. Immune response generated from a Vaccinia virus infection protects the person against a lethal smallpox infection. For this reason, Vaccinia virus was, and is still being used as a live-virus vaccine against smallpox. Unlike vaccines that use weakened forms of the virus being vaccinated against, the Vaccinia virus vaccine cannot cause a smallpox infection because it does not contain the smallpox virus. However, certain complications and/or vaccine adverse effects occasionally arise. Currently, the vaccine is only administered to health care workers or research personnel who have a high risk of contracting the Variola virus, and to the military personnel of the United States of America. Due to the present threat of smallpox-related bioterrorism, there is a possibility the vaccine may have to be widely administered again in the future.

**Vaccines**: U.S. Food and Drug Administration (FDA) licensed a new **vaccine ACAM2000** against smallpox which can be produced quickly upon need. Manufactured by Acambis of Cambridge, England, and Cambridge, Massachusetts, the U.S. Centers for Disease Control and Prevention stockpiled 192.5 million doses of the new vaccine (see list of common strains below).

Vaccinia is also used in recombinant vaccines, as a vector for expression of foreign genes within a host, in order to generate an immune response. Other poxviruses are also used as live recombinant vaccines.

**Vaccinia A**

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2719

| Item | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Vaccinia virus Antibodies | VXV11-BTN | Anti-Vaccinia virus IgG-Biotin conjugate | antibodies |
| | VXV11-FITC | Anti-Vaccinia virus IgG-FITC conjugate | antibodies |
| | VXV11-HRP | Anti-Vaccinia virus IgG-HRP conjugate | antibodies |
| | VXV11-S | Anti-Vaccinia virus (lister) antiserum | antibodies |
| | VXV12-M | Monoclonal Anti-Vaccinia virus IgG, aff pure | antibodies |

Rev. 160310T



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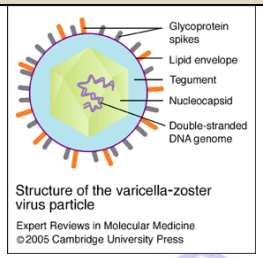
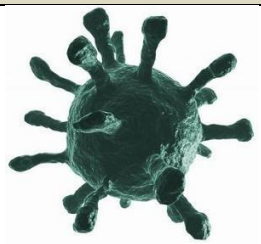
## Varicella Zoster Virus Vaccines (VZV) Antibody ELISA Kits, Recombinant Proteins, and Antibodies

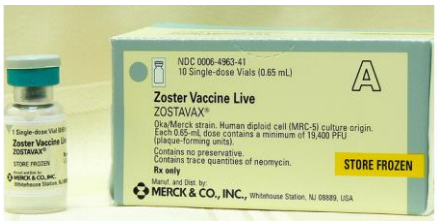
Varicella zoster virus (VZV) is one of eight herpes viruses known to infect humans and other vertebrates. It commonly causes chicken-pox in children and adults and herpes zoster (shingles) in adults and rarely in children. As with the other herpes viruses, VZV causes both acute illness and lifelong latency. Before vaccination became widespread, acute primary infection (varicella or "chickenpox") was common during childhood--especially in temperate climates. Primary infection is much less common in recent years as a result of childhood vaccination, but still may occur in unvaccinated individuals and in instances of vaccine failure. Varicella usually is a benign and self-limiting illness, but can be more severe in adults and in individuals with cellular immunodeficiency. These individuals are at much higher risk of pneumonia and disseminated disease with visceral involvement. Zoster typically presents as a painful, localized cutaneous eruption occurring along 1 or more contiguous dermatomes. As with varicella, zoster usually is self-limited in the immunocompetent host, but immunocompromised persons are at risk of more severe illness with cutaneous or visceral dissemination.



Structure of the varicella-zoster virus particle
Expert Reviews in Molecular Medicine
©2005 Cambridge University Press




A case of shingles caused by VZV




Humans are the only known natural hosts of VZV. Transmission of VZV occurs through direct contact with infectious lesions or by inoculation of aerosolized infected droplets onto a susceptible mucosal surface. The virus is transmitted easily; the rate of secondary cases of varicella in susceptible household contacts typically exceeds 90%. Infectivity usually begins 1-2 days before the onset of rash, and patients remain infectious until all vesicular lesions are dried and crusted. In the immunocompetent host, the period of infectiousness is usually 5-7 days after the lesions first appear.In immunocompromised patients, however, healing can be slow and patients may remain infectious for up to several weeks. (25-34). Within the human body it can be treated by a number of drugs and therapeutic agents including acyclovir for the chicken pox, famciclovir, valaciclovir for the shingles, zoster-immune globulin (ZIG), and vidarabine. VZV immune globulin is also a treatment.

A live attenuated VZV Oka/Merck strain vaccine is available and is marketed in the United States under the trade name **Varivax**. In 2006, the United States Food and Drug Administration approved **Zostavax** for the prevention of shingles. Zostavax is a more concentrated formulation of the Varivax vaccine, designed to elicit an immune response in older adults whose immunity to VZV wanes with advancing age.

Varicella-zoster virus is known by many names, including: chickenpox virus, varicella virus, zoster virus, and human herpes virus type 3 (HHV-3). VZV is closely related to the herpes simplex viruses (HSV), sharing much genome homology. The known envelope glycoproteins (gB, gC, gE, gH, gI, gK, gL) correspond with those in HSV; however, there is no equivalent of HSV gD. The genome is a linear duplex DNA molecule; a laboratory strain has 124,884 base pairs. Laboratory tests are available to diagnose herpes zoster. The most popular test detects VZV-specific IgM antibody in blood; this appears only during chickenpox or herpes zoster and not while the virus is dormant. In larger laboratories, lymph collected from a blister is tested by polymerase chain reaction for VZV DNA, or examined with an electron microscope for virus particles.

VZV vaccines: Varivax (Merck) is a chickenpox vaccine for children, adolescents and adults. Zostavax is a vaccine for shingles for adults age 60 and older. Zostavax is a live vaccine developed by Merck & Co. that has been shown to reduce the incidence of herpes zoster (known as shingles) by 51.3% in a study of 38,000 adults aged 60 and older who received the vaccine.

ADI has developed antibody ELISA kits to determine the efficacy of VZV vaccines or test new vaccines. ADI is further expanding the antibody ELISAs to measure IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

### Varicella Zoster Virus vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2751

| ELISA Kit Description | Species | IgG Specifc Cat# | IgM Specific Cat# | IgA Specific Cat# |
|---|---|---|---|---|
| Varicella Zoster Virus (**VZV) Vaccine** Antibody (chickenpox) ELISA Kits | Human | 520-200-HVG | 520-210-HVM | 520-220-HVG |
| | Mouse | 520-230-HVG | 520-240-HVM | 520-250-HVG |

### Varicella Zoster Virus Related Antibodies, Peptides, and Recombinant Proteins Ordering Information

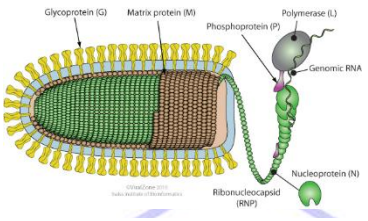
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2751

| | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Varicella Zoster Virus | VZV11-M | Monoclonal Varicella Zoster Virus (chickenpox) antigens IgG (pan, recognizes several VZV proteins | Antigens |
| | VZV12-M | Monoclonal Varicella Zoster Virus (chickenpox) nucleocapsid (155 kda protein) IgG | Antigens |
| | VZV13-M | Monoclonal Varicella Zoster Virus (chickenpox) early gene 62 (175 kda) protein) IgG | Antigens |
| | VZV14-M | Monoclonal Varicella Zoster Virus gp1/IV (chickenpox) glycoprotein I/IV protein) IgG | Antigens |
| | VZV15-N-500 | Varicella Zoster Virus (chickenpox) antigens/proteins (strain Ellen/HF Cells) | Antigens |
| | VZV16-N-500 | Varicella Zoster Virus (chickenpox) antigens/proteins (Rod Ellen/Vero cells) | Antigens |

Varicella_Zoster_Vaccine_Flr 130207A

## Vesicular Stomatitis Virus (VSV) Vaccine ELISA Kits, Recombinant Proteins, and Antibodies

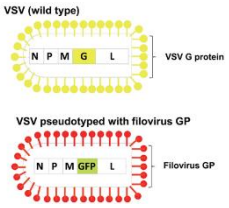
Vesicular stomatitis is a viral disease caused by two distinct serotypes of **vesicular stomatitis virus (VSV) —New Jersey (VSNJV) and Indiana (VSIV)**. Vesiculation, ulceration, and erosion of the oral and nasal mucosa and epithelial surface of the tongue, coronary bands, and teats are typically seen in clinical cases, along with crusting lesions of the muzzle, ventral abdomen, and sheath. **Clinical disease has been seen in cattle, horses, and pigs and very rarely in sheep, goats, and llamas. Serologic evidence of exposure has been found in many species, including cervids, nonhuman primates, rodents, birds, dogs, antelope, and bats**. The clinical symptoms are similar to the very important foot and mouth disease virus (FMDV).




The viruses are members of the family Rhabdoviridae and genus Vesiculovirus. VSV are the prototypes of the Vesiculovirus genus. They are bullet shaped and generally 180 nm long and 75 nm wide. The genomic structure is a single strand of negative-sense RNA (11.1 kb) composed of five genes (**N, P, M, G, and L, representing the nucleocapsid protein, phosphoprotein, matrix protein, glycoprotein, and the large protein**, which is a component of the viral RNA polymerase). The G protein mediates both viral binding and host cell fusion with the endosomal membrane following endocytosis. The L and P proteins are subunits of the viral RNA-dependent RNA polymerase. Although there are many members of the Vesiculovirus genus, the New Jersey and Indiana serotypes are of particular interest in the Western hemisphere. These two viruses are similar in size and morphology but generate distinct neutralizing antibodies in infected animals. They have both been isolated in recent outbreaks in the USA. The virus can be transmitted through direct contact with infected animals with clinical disease (those with lesions) or by blood-feeding insects. In the southwestern USA, black flies (Simulidae) are the most likely biologic insect vector. In endemic areas, sand flies (Lutzomyia) are proven biologic vectors. The prevalence of clinical cases in a herd is generally low (10%–20%), but seroprevalence within the herd may approach 100%.

VSV diagnosis is based on the presence of typical signs and either antibody detection through serologic tests, viral detection through isolation, or detection of viral genetic material by molecular techniques. Three commonly used serologic tests are competitive ELISA, virus neutralization, and complement fixation. PCR tests may also be used to identify the virus. There is no treatment for vesicular stomatitis as animals will typically recover on their own. Control of outbreaks is dependent upon rapid recognition of initial cases, quarantine and restriction of movement of infected and in-contact animals, and insect control. The New Jersey serotype (VSNJV) is responsible for the majority of US cases in animals, and outbreaks caused by Indiana virus (VSIV) have been reported in the USA on only two occasions in the past 40 years, 1966 and 1997–1998. There are no commercially available **VSV vaccines** in the U.S., but an autologous vaccine was made in 1995 to help control that outbreak. Several inactivated vaccines containing both the Indiana and New Jersey serotypes are used in Central and South America.

### VSV-Ebola Vaccine Connection




The simple structure and rapid high-titer growth of VSV in mammalian and many other cells has made it a useful tool in the fields of cellular, molecular biology, virology, and a shuttle vector for many vaccines. VSV-GP (Indiana, 511-aa) is 53% conserved VSV-GP (New Jersey strain 517-aa). The VSIV matrix protein M (Indiana, 229-aa) also is 61% conserved in New Jersey strain (229-aa). The VSV-GP and M antibodies are not cross-reactive within the Indiana and New Jersey strains. VSV-Ebola vaccine is constructed by swapping the wild type VSV-GP (Indiana strain) with the Ebola-GP. It is also referred as **VSVΔG/ZEBOVGP** (for Zaire Ebola strain GP). The modified virus is called a "**Trojan horse**" virus. VSV-based vaccines induce strong protective T cell and antibody responses after a single dose. Vesicular stomatitis viruses are easily propagated in cell culture. Recombinant VSVs expressing foreign proteins have been studied as vaccine vectors for a number of pathogens, including HIV, influenza virus, hepatitis C virus, hepatitis B virus (HBV), measles virus, respiratory syncytial virus, severe acute respiratory syndrome virus, Yersinia pestis, papillomavirus, Ebola virus, and Marburg virus. VSIV has low prevalence of preexisting antibodies so it makes VISV a suitable vector for the Ebola vaccine.

### Use of ADI's VSV Antibody ELISA Kits

**VSIV-Ebola GP vaccines** will produce antibodies to VSIV proteins (N, P, M, and L) and also to the Ebola GP protein. Therefore, it is necessary to the establish basal level of antibodies as well as vaccine-induced levels VSIV proteins such as Matrix M protein and G Protein. The efficacy to VSV-Ebola vaccine or other vaccine can then be correlated with the VSIV vector antibodies in subjects receiving the vaccines. High level of preexisting VSIV antibodies could potentially neutralize the VISV-Ebola vaccine. ADI has made ELISA kits to measure antibodies to VSIV M and G antibodies. ELISA kits for ZEBOV GP are also available.

### Ebola Vaccine/Vector ELISA kits

Product details, data sheets, and pricing available (http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2793)

| ELISA **Type** | Ab type | Mouse | Human | Monkey |
|---|---|---|---|---|
| **VSV** Indiana **Matrix (**VSV-I **M)** Antibody ELISA Kits, **96 tests, Quantitative** | IgG | AE-327200-1 | AE-327210-1 | AE-327220-1 |
| **VSV** Indiana Glycoprotein **(**VSV-I G**)** Antibody ELISA Kits, **96 tests, Quantitative** | IgG | AE-327300-1 | AE-327310-1 | AE-327320-1 |
| New **AD5** (Adenovirus hexon 5 vectors based) **Vaccines**, **96 tests, Quantitative** | IgA | | 950-100-AHA | |
| | **IgG** | 950-130-AMG | 950-110-AHG | 950-150-AMG |
| | IgM | 950-140-AMM | 950-120-AHM | 950-155-AMM |
| New Custom ELISA testing of Anti-VSV IgG or IgM in human or animal samples (vaccinated or normal) | AE-327210-CUX (Please call for a quote) | | | |

****Notes:** The above ELISA kits contain recombinant protein made and purified from E. coli or sf9 host cells. There is no Ebola virus or antibodies in the kit. All of the above kits are for in vitro research use only (RUO), not for diagnostic or therapeutic use.

## Vesicular Stomatitis Virus (VSV) Vaccine ELISA Kits, Recombinant Proteins, and Antibodies



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Email: customerservice@lifetechindia.com Website: www.lifetechindia.com

| Catalog# | Product Description | Product Type |
|---|---|---|
| **AE-327210-01N** | Human Anti-Vesicular Stomatitis Virus Matrix Protein, Indiana, (VSV-I M) IgG Negative Serum | Disease Sera, VSV |
| **AE-327210-02P** | Human Anti-Vesicular Stomatitis Virus Matrix Protein, Indiana, (VSV-I M) IgG positive Serum | Disease Sera |
| **AE-327220-01N** | Monkey Anti-Vesicular Stomatitis Virus Glycoprotein, Indiana (VSV-I G) IgG Negative Serum | Disease Sera, VSV |
| **AE-327220-02N** | Monkey Anti-Vesicular Stomatitis Virus Matrix Protein, Indiana, (VSV-I M) IgG Negative Serum | Disease Sera, VSV |
| **AE-327220-02P** | Monkey Anti-Vesicular Stomatitis Virus Glycoprotein, Indiana (VSV-I G) IgG positive Serum | Disease Sera |
| **AE-327220-03N** | Monkey Anti-Vesicular Stomatitis Virus Glycoprotein, New Jersey (VSV-NG) IgG Negative Serum | Disease Sera, VSV |
| **AE-327220-03P** | Monkey Anti-Vesicular Stomatitis Virus Matrix Protein, Indiana, (VSV-I M) IgG positive Serum | Disease Sera |
| **AE-327220-04P** | Monkey Anti-Vesicular Stomatitis Virus Glycoprotein, New Jersey (VSV-NG) IgG positive Serum | Disease Sera |
| **AE-327310-01N** | Human Anti-Vesicular Stomatitis Virus Glycoprotein, Indiana (VSV-I G) IgG Negative Serum | Disease Sera, VSV |
| **AE-327310-02P** | Human Anti-Vesicular Stomatitis Virus Glycoprotein, Indiana (VSV-I G) IgG positive Serum | Disease Sera |
| **AE-327310-03N** | Human Anti-Vesicular Stomatitis Virus Glycoprotein, New Jersey (VSV-NG) IgG Negative Serum | Disease Sera, VSV |
| **AE-327310-04P** | Human Anti-Vesicular Stomatitis Virus Glycoprotein, New Jersey (VSV-NG) IgG positive Serum | Disease Sera |
| **MFPM20-C** | Multi Fusion-Tagged Protein Marker containing 5 tags (His, T7, Myc, HA, VSV-G tags) Protein (Pure ~20 Kda) for ELISA/Western | WB Control |
| **MFPM52-C** | Multi Fusion-Tagged recombinant Protein 52-Kda containing 16-tags (T-7, HSV, C-myc, VSV-G, Glu-Glu, V5, e-tag, Flag, S-tag, HA, KT3, E2, Au1, Au5, 6xHis tags) for ELISA/Western | WB Control |
| **MFPM52-R-40** | Multi Fusion-Tagged recombinant Protein 52-Kda containing 16-tags (T-7, HSV, C-myc, VSV-G, Glu-Glu, V5, e-tag, Flag, S-tag, HA, KT3, E2, Au1, Au5, 6xHis tags) for ELISA | Pure protein |
| **SP-101337-5** | VSV-G Peptide (AA: Tyr-Thr-Asp-Ile-Glu-Met-Asn-Arg-Leu-Gly-Lys) (MW: 1339.5) | Pure Peptide |
| **VSIG11-C** | Recombinant (E. Coli) Vesicular Stomatitis Virus GlycoProtein, Indiana (VSV-I M) Protein Control for Western Blot | Western Control |
| **VSIG11-S** | Anti-Vesicular Stomatitis Indiana Virus Glycoprotein, Indiana, (VSV-I G) Antiserum | antiserum |
| **VSIG15-R-10** | Recombinant (E. Coli) Vesicular Stomatitis Virus GlycoProtein, Indiana (VSV-I G), his-tag, ~54 kDa; >95% Pure | Rec. protein |
| **VSIM12-C** | Recombinant (E. Coli) Vesicular Stomatitis Virus Matrix Protein, Indiana (VSV-I M) Protein Control for Western Blot | Western Control |
| **VSIM12-S** | Anti-Vesicular Stomatitis Indiana Virus Matrix Protein, Indiana (VSV-I M) Antiserum | antiserum |
| **VSIM16-R-10** | Recombinant (E. Coli) Vesicular Stomatitis Virus Matrix Protein, Indiana, (VSV-I M) his-tag, ~29.5 kDa; >95% Pure | Rec. protein |
| **VSNG13-C** | Recombinant (E. Coli) Vesicular Stomatitis Virus Glycoprotein, New Jersey (VSV-NG) Control for Western Blot | Western Control |
| **VSNG13-S** | Anti-Vesicular Stomatitis Virus Glycoprotein, New Jersey (VSV-NG) Antiserum | antiserum |
| **VSNG17-R-10** | Recombinant (E. Coli) Vesicular Stomatitis Virus Glycoprotein, New Jersey (VSV-NG), his-tag, ~55.1 kDa; >95% Pure | Rec. protein |
| **VSV11-Cy** | Monoclonal Anti-Vesicular Stomatitis Virus Glycoprotein (VSV-G)-Cy conjugate for Immunofluorescence | Antibodies |
| **VSV11-HRP** | Monoclonal Anti-Vesicular Stomatitis Virus Glycoprotein (VSV)-IgG-HRP conjugate | Antibodies |
| **VSV11-M** | Monoclonal Vesicular Stomatitis Virus Glycoprotein (VSV) Glycoprotein (fusion-tag) antibody, ascites | Antibodies |
| **VSV11-P** | Vesicular Stomatitis Virus Glycoprotein (VSV) Glycoprotein (fusion-tag) Control/blocking peptide #1 | Peptide |
| **VSV12-A** | Anti-Vesicular Stomatitis Virus Glycoprotein (VSV-tag)-IgG, aff pure | Antibodies |

VSV-Vaccines-ELISA-Flr 151104A



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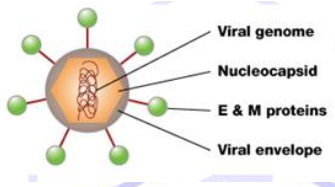
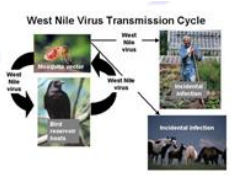
## West Nile Virus (WNV) Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

**West Nile virus (WNV)** is a mosquito-borne zoonotic arbovirus belonging to the genus Flavivirus in the family Flaviviridae. This flavivirus is found in temperate and tropical regions of the world. It was first identified in the West Nile subregion in the East African nation of Uganda in 1937. WNV is now considered to be an endemic pathogen in Africa, Asia, Australia, the Middle East, Europe and in the United States, which in 2012 has experienced one of its worst epidemics. The main mode of WNV transmission is via various species of mosquitoes which are the prime vector, with birds being the most commonly infected animal and serving as the prime reservoir host - especially passerines which are of the largest order (Passeriformes) of birds. Symptoms may include fever, headaches, fatigue, muscle pain or aches, malaise, nausea, anorexia, vomiting, myalgias and rash. People of advanced age, the very young, or those with immunosuppression, either medically induced, such as those taking immunosupressive drugs, or due to a pre-existing medical condition such as HIV infection, are most susceptible. The specific neurological diseases which may occur are West Nile encephalitis, which causes inflammation of the brain, West Nile meningitis, which causes inflammation of the meninges which are the protective membranes that cover the brain and spinal cord, West Nile meningoencephalitis, which causes inflammation of the brain and also the meninges surrounding it, and West Nile poliomyelitis - spinal cord inflammation which results in a syndrome similar to polio, which may cause acute flaccid paralysis.






WNV is one of the Japanese encephalitis antigenic serocomplex of viruses. The genetic material of WNV is a positive-sense, single strand of RNA, which is between 11,000 and 12,000 nucleotides long; these genes encode seven nonstructural proteins and three structural proteins. The RNA strand is held within a nucleocapsid formed from 12-kDa protein blocks; the capsid is contained within a host-derived membrane altered by two viral glycoproteins. Preliminary diagnosis is often based on the patient's clinical symptoms, places and dates of travel (if patient is from a non-endemic country or area), activities, and epidemiologic history of the location where infection occurred. Preliminary diagnosis is often based on the patient's clinical symptoms, places and dates of travel (if patient is from a non-endemic country or area), activities, and epidemiologic history of the location where infection occurred. Definitive diagnosis of WNV is obtained through detection of virus-specific antibody Immunoglobulin M (IgM/IgG) antibodies by ELISA.



**WNV Vaccine**: Currently, no vaccine against WNV infection is available for humans. There are some vaccines available for veterinary us. A vaccine for horses (ATCvet code: QI05AA10; ) based on killed viruses exists; some zoos have given this vaccine to their birds, although its effectiveness is unknown. Some animal vaccines use inactivated WNV (K-WN/**WNV-Innovator**, Fort Dodge; Pfizer) alone or in combination with Tetanus or encephalitis. **Equine Recombitek rWNV vaccine** (Merial) consists of a canarypox virus vector with insertion and expression of the membrane (**prM**) and envelope (**E**) proteins of WNV. The latest equine vaccine approved in 2006 is a single-dose, attenuated **West Nile virus, live flavivirus chimera vaccine (WN-FV)** (PreveNile; Intervet, De Soto,KS) for horses and is marketed without an adjuvant. The recombinant chimera expresses the E and prM proteins of WNV in a yellow fever vector (YF17D). The vaccine has been labeled for use in horses for the prevention of West Nile virus viremia and as an aid in the prevention of WNV disease and encephalitis. Typically, efficacy of the vaccine has been followed by the protection of the horses or other animals from live virus challenge. In some studies the antibody neutralization tests were performed but no specific antibodies tests (ELISA) were perform to measure the antibody titer to the Envelop or the prM-proteins.

ADI has developed antibody ELISA kits to determine the efficacy of WNV vaccines. Antibody tests are available for the envelop and prM protein of the WNV. to Recombinant proteins and antibodies to WNV are also available to facilitate research on WNV vaccine. A novel recombinant WNV fusion protein (Capsid+prM+Envelop) protein has been cloned, expressed, and purified. This fusion protein invoked very string antibody response than achieved with the WNV whole virus or DNA vaccines. Recombinant WNV subunit-vaccine is being tested by ADI as a potential human vaccine candidate.

### West Nile Virus Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2777

| Items Description | Species | Antibody Type IgG Cat# | Antibody Type IgM Cat# |
|---|---|---|---|
| West Nile Virus Mosaic Proteins Vaccine (**Capsid+prM+Envelop**) Antibody ELISA kits | Mouse | 910-210-WNG | 540-110-DHM |
| | Horse | 910-310-WNG | 910-320-WNG |
| | Human | 910-410-WNG | 910-420-WNG |
| West Nile Virus prM Vaccine Antibody ELISA kits | Mouse | 910-230-WNG | 910-240-WNG |
| | Horse | 910-330-WNG | 910-340-WNG |
| | Human | 910-430-WNG | 910-440-WNG |
| West Nile Virus **Envelop Vaccine** Antibody ELISA kits | Mouse | 910-250-WNG | 910-260-WNG |
| | Horse | 910-450-WNG | 910-460-WNG |
| | Human | 910-430-WNG | 910-440-WNG |

West_Nile_Virus_Vaccine_Flr. 130207A



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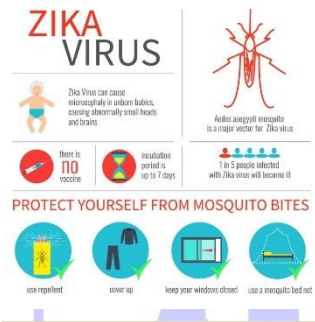
# Zika Virus Vaccines


**Zika virus** was first isolated in 1947 from a monkey in Zika forest in Uganda. Zika virus has been known to infect humans since and a serological survey in 1952 found 50 people out of 84 had developed antibodies. Zika then spread to many African and Asian countries. Since April 2015, a large, ongoing outbreak of Zika virus that began in Brazil has spread to much of South and Central America and the Caribbean. So far, only about a dozen people in the United States have been infected, mostly travelers from abroad. But the virus is expected to arrive in Florida, Texas, and other Southern states during the spring and summer mosquito season. For most people, Zika isn't very dangerous at all. Only 1 in 5 people (20%) show any symptoms whatsoever, and those usually involve a low-grade fever, sore body, headache, and sometimes a rash. Zika is causing an alarm because of its association with birth defects or microcephaly (small head or incomplete brain development) in newborn babies by mother-to-child transmission, as well as a stronger one with neurologic conditions in infected adults, including cases of **Guillain–Barré syndrome (GBS).** CDC found Zika in the brains of two babies with microcephaly and evidence of Zika in two pregnancies that ended in miscarriage. Although there is still no definite cause of microcephaly but Brazil has 20-times more cases in the last two years.

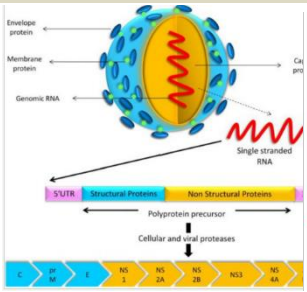


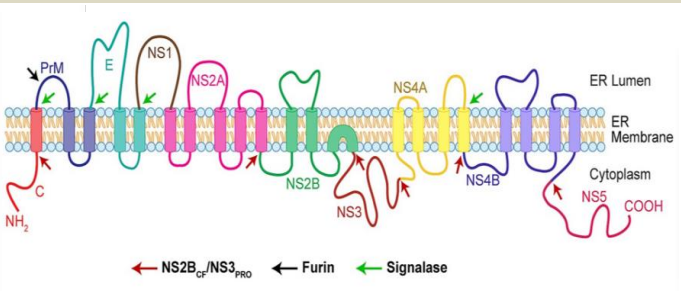


Zika virus (ZIKV) is a member of the virus family Flaviviridae and the genus Flavivirus (*flavus* means yellow), transmitted by daytime-active Aedes mosquitoes, such as A. aegypti and A. albopictus. Zika virus is related to the dengue, yellow fever, Japanese encephalitis, and West Nile viruses. Like other flaviviruses, Zika virus is enveloped and icosahedral and has a non-segmented, positive-sense ss-RNA genome. There are two lineages of the Zika virus: The African lineage, and the Asian lineage. Phylogenetic studies indicate that the virus spreading in the Americas is most closely related to the Asian strain. Effective **vaccines** for yellow fever virus, Japanese encephalitis, and tick-borne encephalitis have been develop but there are **no vaccines for Zika virus**.

Zika Virus Information Video
https://commons.wikimedia.org/w/index.php?title=File%3AZika_virus_video_osmosis.webm
http://www.cdc.gov/media/dpk/2016/dpk-zika-virus.html

**Diagnosis** - Unlike other flaviviruses, not much is commercially available for Zika virus's recombinant proteins, antibodies, and diagnostic ELISA kits. For now, diagnosis confirmed by detecting the viral DNA by PCR. During the **Ebola and MERS** emergence in 2014, ADI was the first company to develop many recombinant proteins and antibodies that were used to develop antibody ELISA kits**.** These kits played a critical role in testing the Ebola vaccines (**Rampling T et** al, 2015, A Monovalent Chimpanzee Adenovirus Ebola Vaccine — Preliminary Report, **New Eng. J. Med**. DOI: 10.1056/NEJMoa1411627; **Huttner A**, 2015, The effect of dose on the safety and immunogenicity of the VSV Ebola candidate vaccine: a randomized double-blind, placebo-controlled phase 1/2 trial, **Lancet 15, 1156-1166).**




The Zika virus is a positive sense ss-RNA (25-30 nm, 10794 nt). The open reading frame of the Zika virus codes for a polyprotein that is subsequently cleaved into capsid (C), precursor membrane (prM), envelope (E), and non-structural proteins (NS). The E protein composes the majority of the virion surface and is involved with aspects of replication such as host cell binding and membrane fusion. NS1, NS3, and NS5 are large, highly-conserved proteins while the NS2A, NS2B, NS4A, and NS4B proteins are smaller, hydrophobic proteins. Like other flaviviruses, both structural and non-structural protein antibodies are detected during Zika virus infection. The member of flaviviruses share 40-60% protein sequence conservation. Moreover, vaccines have become available for JEV, YFV, and Dengue. Therefore, it is important to rule out the presence of Zika antibodies due to vaccination and/or infection from related viruses.

*We have cloned and expressed several Zika viral proteins (Capsid, Envelop, prM, and NS1) antibodies, and developed ELISA kits for the detection and measurement of Zika related antigens and antibodies. These ELISA kits will help develop and test Zika virus vaccines in animals and humans. ADI's Zika antibody ELISA kits contain highly purified recombinant proteins and antibodies. All reagents and ELISA kits are 'For research use only (RUO), not for diagnosis, cure or prevention of the disease. Additional ELISA kits and antibodies are available for Ebola vaccine vectors (Adenovirus, VSV, and Rabies virus proteins) to determine efficacy of Ebola vaccines.*

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## What Zika Virus Antibody to use

Flaviviruses are known to induce antibodies to several **structural** (Envelop, prM, and capsid) and **non-structural** proteins (NS1). A number of diagnostic tests are available to research, diagnose various flaviviruses (West Nile, JEV, YFV, TBEV) and develop vaccines. In general, IgM antibodies are made soon after the virus exposure and IgG antibodies are persist longer. However, there is very little known about the utility of the Zika virus antibodies. ADI is making available a number of ELISA kits to help understand the Zika virus infection and study any available vaccines or therapeutic interventions.

### Zika Virus vaccine Related ELISA kits (See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2762

| Product Description | Species | IgG cat # | IgM cat # |
|---|---|---|---|
| RecombiVirus™ Zika Virus **Envelop antibody** ELISA kits, Quantitative, 96 tests | Human | RV-403100 | RV-403105 |
| | Monkey | RV-403110 | RV-403115 |
| | Mouse | RV-403120 | RV-403125 |
| RecombiVirus™ Zika Virus **PrM antibody** ELISA kits, Quantitative, 96 tests | Human | RV-403200 | RV-403205 |
| | Monkey | RV-403210 | RV-403215 |
| | Mouse | RV-403220 | RV-403225 |
| RecombiVirus™ Zika Virus **NS1 antibody** ELISA kits, Quantitative, 96 tests | Human | RV-403300 | RV-403305 |
| | Monkey | RV-403310 | RV-403315 |
| | Mouse | RV-403320 | RV-403325 |
| RecombiVirus™ Zika Virus **Capsid antibody** ELISA kits, Quantitative, 96 tests | Human | RV-403400 | RV-403405 |
| | Monkey | RV-403410 | RV-403415 |
| | Mouse | RV-403420 | RV-403425 |

****Notes:** The above ELISA kits contain recombinant protein made and purified from E. coli or sf9 host cells. There is no Zika virus (live or killed). All of the above kits are for in vitro research use only (RUO), not for diagnostic or therapeutic use.

### Zika Virus vaccine Related Antibodies, Proteins and other Reagents

| Type# | Catalog# | Product Description | Product Type |
|---|---|---|---|
| Zika Env | ZENV15-R-10 | Recombinant (E. coli) Zika Virus Envelop Protein (full length, >95%, his tag) for ELISA/Western | Rec. protein |
| | ZENV11-S | Anti-Zika Virus Envelop Protein (full length, >95%, his tag) antiserum | Antibodies |
| | ZENV11-C | Recombinant (E. coli) Zika Virus Envelop Protein control for Western blot | Western control |
| Zika prM | ZPRM15-R-10 | Zika Virus prM Protein (EC-domain, >95%, synthetic, no tag) for ELISA/Western | Rec. protein |
| | ZPRM11-S | Anti-Zika Virus prM Protein (EC-domain, >95%) antiserum | Antibodies |
| | ZPRM11-C | Zika Virus prM Protein control for Western blot | Western control |
| Zika Capsid | ZCAP15-R-10 | Recombinant (E. coli) Zika Virus Capsid Protein (full length, >95%, his tag) for ELISA/Western | Rec. protein |
| | ZCAP11-S | Anti-Zika Virus (E. coli) Capsid Protein (full length, >95%, his tag) antiserum | Antibodies |
| | ZCAP11-C | Recombinant (E. coli) Zika Virus Capsid Protein control for Western blot | Western control |
| Zika NS1 | ZNS115-R-10 | Recombinant (E. coli) Zika Virus NS1 Protein (full length, >95%, his tag) for ELISA/Western | Rec. protein |
| | ZNS111-S | Anti-Zika Virus (E. coli) NS1 Protein (full length, >95%, his tag) antiserum | Antibodies |
| | ZNS111-C | Recombinant (E. coli) Zika Virus NS1 Protein control for Western blot | Western control |
| | ZNS116-R-10 | Recombinant (HEK) Zika Virus NS1 Protein (full length, >95%, his tag) for ELISA/Western | Rec. protein |

ADI also has recombinant proteins ELISA kits for West Nile Virus, Dengue Viruses, Japanese Encephalitis Virus (JEV),

Zika_Vaccines_ELISA_Flr 160223A



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