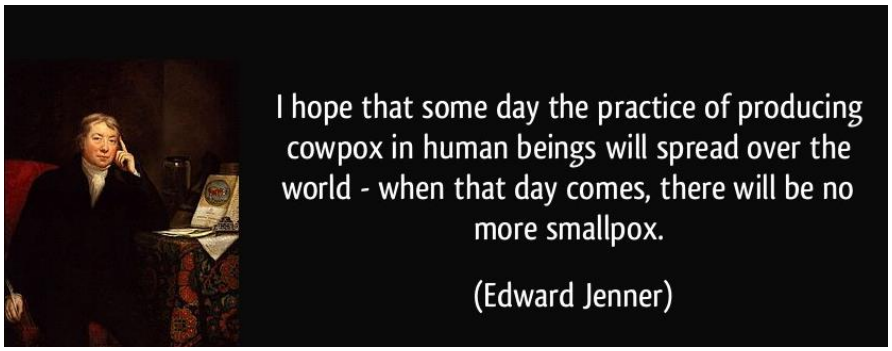
Vaccine Research Catalog - 2016

From Adenovirus to Zika Virus
Explore the World of Vaccines

ALPHA DIAGNOSTIC
INTERNATIONAL
ENABLING INNOVATIVE RESEARCH

Nobel Laureates and Pioneers whose work led to the development of vaccines



Edward Jenner (1749-1823), an English Physician, who developed the first vaccine for small pox. He is regarded as "father of immunology" and vaccine. He also coined the term 'Vaccine" in his original Publication: '*1798 An Inquiry into the Causes and Effects of the Variolæ Vaccinæ'*.

In 1979, the World Health Organization declared smallpox an eradicated disease.

Year	Nobel Laureate	Major Research Citation
1901	EA von Behring	Serum therapy for diphtheria
1902	R Ross	Life cycle of the malaria parasites
1905	R Koch	Tuberculosis
1907	CAL Laveran	Transmission of Malaria by Mosquito
1908	E Metchnikoff, P Ehrlich	Immune System
1912	A Carrel	Organ and blood vessel transplantation
1913	C Richet	Anaphylaxis
1919	J Bordet	Complement system
1927	J Wagner-Jauregg	Used malaria to treat syphilis
1928	C. Nicolle	Transmission of Typhus by Lice
1930	K Landsteiner	Human blood groups
1951	M Theiler	Vaccine for yellow fever
1953	SA Waksman,	Streptomycin Treatment of tuberculosis
1954	JF Enders, TH Weller and FH Robbins	Polio virus culture and polio vaccine
1958	GW Bedle, EW Tarum; J Lederberg	Gene regulation and bacterial genetics
1959	OA Kornberg	Synthesis of RNA and DNA
1960	PB Medawar, FM Burnet	Self and non-self
1962	FHC Crick, JD Watson, HF Wilkins	Structure of DNA
1965	F Jacob, A Lwoff, J Monod	Genetic control of virus synthesis
1966	CB Huggins, FP Rous	Virus and Cancer
1972	GM Edelman, RR Porter	Structure of antibodies
1975	D Baltimore, RR Porter	Reverse Transcriptase
1976	BS Blumberg, DC Gajdusek	Hepatitis antigens
1977	RS Yalow, RCI Guillemin, AV Schally,	Prion and RIA
1978	D Nathans, HO Smith, W Arber	Restriction enzyme and viral genome maps
1980	B Benacerraf, J Dausset, GD Snell; P Berg W Gilbert, F Sanger	MHC, Concept of self & Non-Self and DNA Sequencing
1983	B McClintock, K Mullis	Transposons; PCR
1984	N Jerne, GJF Köhler, C Milstein	Monoclonal antibodies
1987	S Tonegawa	Diversity of antibodies
1989	JM Bishop, HE Varmus	Retroviral oncogenes
1990	JE Murray, ED Thomas	Organ and cell transplantation
1993	M. Smith	Generation of site-specific mutants
1996	PC. Doherty, RM Zinkernagel	Immune system and MHC restriction
1997	SB Pruisner	Prions
2005	B. Marshall, R Warren	H. pylori and peptic ulcer
2008	H zur Hausen; F Barré-Sinoussi, L Montagnier,	HPV; HIV
2011	B Beutler, JA Hoffmann; RM Steinman	Innate Immunity; Dendritic cells
2012	JG Gurdon, S Yamanaka	cell differentiation and ***pluripotent cells***
2015	WC Campbell, S Omura; T Tu	Therapy against roundworm; Artemisinin against Malaria

Pioneers (Did not win noble prize**):**

Edward Jenner (1797, First ever vaccine for Cowpox/smallpox vaccine)
Louis Pasteur (1886, Rabies, Anthrax, and Cholera Vaccines)
E. Engvall & S. Perlmann (1971, ELISA Technique)

ABOUT ADI

Alpha Diagnostic International, Inc. (ADI) is a privately held, U.S. biotechnology company headquartered in San Antonio, Texas and founded in 1993. The primary focus during the early years was the development of immunoassay reagents and kits that were not readily available to researchers. Over the years, the company expanded its focus and product development efforts to providing solutions for the unmet needs in vaccines, therapeutics, biologic drugs, infectious disease ELISA, and other novel products directed towards the consumer market which includes meat adulteration testing and rapid tests for fertility monitoring in household pets and farm animals. Our major programs are:

Human and Animal Vaccine Design and ELISA Tests

Human Therapeutics (humanized antibodies) and Drug Conjugate ELISA Tests

Veterinary Disease and Vaccine ELISA Tests

Laboratory Animals Health ELISA

Bioinformatics & Proteomics
Custom gene synthesis, protein or peptide synthesis, and antibody services have been available since 1993. More than 3000 citations in peer reviewed journals.

Unique Technologies:

VacciGel™ ELISA Kits**:** An innovative and industry's first test for the direct identification and measurement of vaccine components adsorbed on Alum adjuvants.

TruStrip™ Sample Transfer System: A novel product that allows for quantitative transfer, storage, and transport without destroying the biological activity of DNA, proteins, enzymes, and antibodies.

ZikaSelect & DengueSelect ELISA for the Quantification of Zika or Dengue specific antibodies in the presence of crossreactive antibodies from flaviviruses.

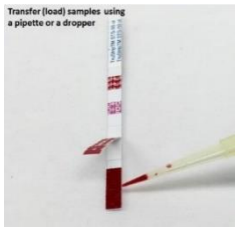
ABOUT VACCINE RESEARCH CATALOG-2016

The major focus of ADI is on the design, testing, and development of tests for various human and animal vaccines and therapeutics (humanized antibodies). From Adenovirus to Zika Virus, ADI's 2016 Vaccine Catalog offers:

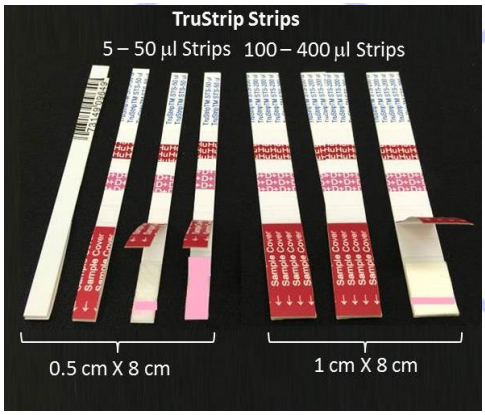
- ~55 human vaccines (Bacterial, Viral, and Parasitic Vaccines)
- ~1200 Vaccine testing kits
- ~2000 Recombinant proteins, antigens, peptides, and antibodies

From Adenovirus to Zika Virus - Explore the World of Vaccines.

TruStrip™ Sample Transfer System (STS) – A smart, efficient, tamper-proof and inexpensive means of collecting, archiving, transporting, and testing of biological samples



TruStrip™ strips and the **storage/transport trays** constitute the **TruStrip™ Sample Transfer System (STS)**. TruStrip strips are an efficient, tamper-proof, and inexpensive means of collecting defined volumes (5, 10, 15, 25, 50, 100, 200 and 400 µl) of biological samples (blood, serum, plasma, urine, proteins, antibodies, DNA, bioanalytical reagents, and chemicals) on pre-calibrated volumetric strips - without the need for any measuring devices such as a pipette. The samples that are collected on these strips can be used for archiving, transporting, and testing, as necessary. Individual strips containing samples are air dried and stored in a specially designed storage and transport tray for long term preservation at room temperature. The TruStrip tray design allows storage of thousands of individual samples in small amount of space. Samples are kept in individual trays that can be opened and closed without touching other samples. The samples collected on TruStrip strips can be easily shipped at room temperature without the use of refrigeration or dry ice, which prevents expensive shipping costs. The samples can be shipped as a single tray or in clusters of 5-10 samples. The dried samples from TruStrip strips can be quantitatively recovered by simple immersion and gentle shaking in water, saline, buffer or solvent. TruStrip strips have been designed for sample recovery and processing individually or in high-throughput 96-well formats.



The active sample pad of TruStrip strips also contains a proprietary "sample tracking dye (STD)" that enables tracking of sample load (sample-on) and elution (sample-off) – very useful if the sample is colorless. The unique sample pad and strip design have added features, such as a non-porous inert support, prevention of sample contamination, separation of samples strip during storage and transport, color coded sample or species identification labels, and sample load volume labels. The backside of the strips can be used for writing sample ID or applying barcode labels, for easy identification. TruStrip STS eliminates the challenges in contaminant-free sampling, preserving, transporting, processing, and quantitative recovery of samples (proteins, enzyme, antigens, antibodies, and DNA). Environmental, toxicological, forensic, food, drug, and plant samples can also be transferred, archived, transported and tested.

Clinical human or animal samples, such as dried blood spots (DBS) are considered non-hazardous by the US Dept. of Transportation (DOT). The Centers for Disease Control and Prevention (CDC) also considers DBS as a non-hazardous, non-regulated, and exempt material.

TruStrip™ Sample Transfer Strips- Ordering Information

TruStrip strips without Sample Tracking Dye (STD)		TruStrip strips with Sample Tracking Dye (STD)	
Cat#	**Description**	**Cat#**	**Description**
STS-05-50	TruStrip™ Sample Transfer Strip, 5 µl, 50/Pk	STSD-05-50	TruStrip™ Sample Transfer Strip, 5 µl, 50/Pk
STS-15-50	TruStrip™ Sample Transfer Strip, 15 µl, 50/Pk	STSD-15-50	TruStrip™ Sample Transfer Strip, 15 µl, 50/Pk
STS-25-50	TruStrip™ Sample Transfer Strip, 25 µl, 50/Pk	STSD-25-50	TruStrip™ Sample Transfer Strip, 25 µl, 50/Pk
STS-50-50	TruStrip™ Sample Transfer Strip, 50 µl, 50/Pk	STSD-50-50	TruStrip™ Sample Transfer Strip, 50 µl, 50/Pk
STS-100-25	TruStrip™ Sample Transfer Strip, 100 µl, 25/Pk	STSD-100-25	TruStrip™ Sample Transfer Strip, 100 µl, 25/Pk
STS-200-25	TruStrip™ Sample Transfer Strip, 200 µl, 25/Pk	STSD-200-25	TruStrip™ Sample Transfer Strip, 200 µl, 25/Pk
STS-400-25	TruStrip™ Sample Transfer Strip, 400 µl, 25/Pk	STSD-400-25	TruStrip™ Sample Transfer Strip, 400 µl, 25/Pk

TruStrip™ Sample Storage Trays- Ordering Information

at#	Description
STT5-50	TruStrip™ Sample Storage/Transportation Trays for 5-50 µl Size Strips (5 individual detachable chambers per tray, each chamber has "snap-close" lid; 10 trays for 50 strips)
STT10-25	TruStrip™ Sample Storage/Transportation Trays for 100-400 µl Size Strips (5 individual detachable chambers per tray, each chamber has "snap-close" lid; 5 trays for 25 strips)

Product details & usage http://www.TruStrips.com (dedicated webbsiste for TruStrips Brand)

Watch TruStrip™ Video at YouTube
https://www.youtube.com/watch?v=FZB7L4zrwFM

TruStrip-STS-Sample-Transfer-System Flyer-2 16611A

Vaccine & Drug Development: Custom Vaccine 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 Hu
- Animal and human autoimmune ELISA kits
- Therapeutic humanized antibodies
- Animal health screening
- Host Cell Proteins (HCPs) ELISA
- Serum Proteins, Hormones, and Tumor Markers

Advantages of working with ADI?

- ✓ *20+ years of industry experience*
- ✓ *ADI is the sole manufacturer of 100s of ELISA kits. Other CROs will purchase 333kits from ADI. It cost more and loss of time.*
- ✓ *Most competitive pricing and efficient documentation of data*
- ✓ *Confidential GLP-level testing*
- ✓ *Contact ADI for details and customized quote.*

About ADI's ELISA Kit Presentation and Format

ADI has been manufacturing high quality ELISA kits for >22-years in our facility in San Antonio, Texas, USA. Our kits have the following the features and presentation:

- ELISA plates are pre-coated; 8x12 strip well format.
- Most kits have 12-months expiration and few kits have 6-months.
- Most kits utilize room temp incubation with no shaking for ease of use.
- All of the vaccine antibody ELISA kits are quantitative.
- ADI has full warranty for kit performance as per specifications.

About Vaccine Research ELISA Kits Catalog -2016

This listing is prepared to provide a quick access to appropriate catalog # available for a given vaccine or disease. This list is available in print as well as pdf file at our website (http://www.4adi.com/objects/catalog/product/extras/ADI-Vaccines-Research-Catalog-2016.pdf). The left column (e.g., Adenovirus) is hyperlinked to actual product listing and pricing in US$ for customers in USA. ELISA kit manuals are available at our website for most products or can be provided upon request. The pdf icon is hyperlinked and opens a detailed 1-2-page description of the disease and available kits for vaccines testing.

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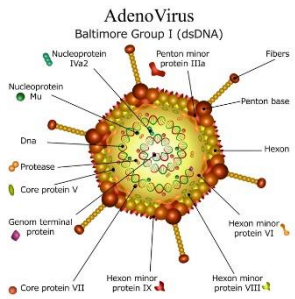


Adenoviruses (members of the family Adenoviridae) are medium-sized (90–100 nm), non-enveloped viruses with an icosahedral nucleocapsid containing a dsDNA genome. Their name derives from their initial isolation from human adenoids in 1953. Adenoviruses are also known to cause respiratory infections in **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 adenovirus infection is the most frequently caused viral disease of the respiratory tract among preschool children (types 1 - 5 and 7). 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. FDA has approved Teva Phram Adenovirus type 4 and 7 live oral vaccines in 2011. The new **adenovirus vaccine tablets** offer 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 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 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.

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).

About ADI ELISA Kits: ADI has developed adenovirus (Ad5/Hxn) antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. Antibody ELISA kits for species or subtypes not listed can also be provided. The kits can be used to assess the basal immunity or vaccine induced antibodies to Ad5/Hxn.

Adenovirus vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2744

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	

Adenovirus Related Antibodies and Reagents

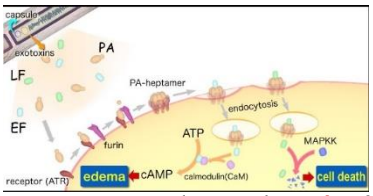
Item	Catalog#	Product Description	Product Type
Adenovirus Virus antibodies	ADV11-A	Goat Anti-Adenovirus type 2, hexon IgG (reacts with 1-7a, 8, 31, 40-41)	antibodies
	ADV11-FITC	Goat Anti-Adenovirus type 2, hexon IgG-FITC conjugate	antibodies
	ADV12-FITC	Monoclonal Anti-Adenovirus (many isotypes) IgG-FITC 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 hexon antigens, purified (host Vero cells)	Antigen

Adenovirus_Vaccine_Flr 160604A

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 (**PA83**) 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 (**PA63**) that subsequently binds with LF or EF and 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 (**Biothrax**), the only licensed human anthrax vaccine in the United States. The filtrate contains a mix of cellular products including PA83 and is adsorbed to aluminum hydroxide (**Alum**) 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. 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

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

ELISA Kit Description	Kit Type	Species	Total Ig's Cat#	IgG Specific Cat#
Anthrax Vaccine Protective Antigen 83 (PA83) antibody ELISA kits Notes: Antibody ELISA kits are designed to detect either total Ig's (A+G+M) or total IgG (no IgA or IgM) or IgM antibody isotypes. It is possible to custom order total Ig's or IgG or IgM for other species.	PA83 Antibody	Human	900-160-83T	900-165-83G
		Mouse	900-100-83T	900-105-83G
		Monkey	900-150-83T	
		G. pig	900-140-83T	
		Rabbit	900-120-83T	
		Sheep		900-170-83G
Humanized Antibody ELISA kit (bioactivity test)	Humanized anti-PA antibody	900-155-HPA		
PA83 Protective Antigen 83 (PA83) ELISA Kits	PA83 Antigen	# 800-110-P83 (PA83)		
PA83 Rapid Test, 25/pk (results in 2-5 mins)		# 800-100-RDT		
Vaccigel Anthrax Protective Antigen 83 (PA83) Protein Adsorbed on Alum, ELISA kit for 50 tests		# VAC-P83-50		
Anthrax Vaccine Anti-Edema Factor (EF) Antibody ELISA kits	EF Antibody (Ab)	Human		900-310-EFH
		Rabbit	900-320-EFR	
		Mouse	900-300-EFM	
		Monkey		900-380-EFM
		Bovine		900-340-EFB
Edema Factor (EF) Protein ELISA kit, Quantitative, 96 tests	EF Antigen	# 800-130-EF		
Anthrax Vaccine Anthrax Lethal Factor (LF) antibody ELISA kits	LF Antibody (Ab)	Mouse	900-200-LFM	
		Human		900-220-LFH
		Rabbit		900-220-LFR
		Monkey		900-280-LFM
Lethal Factor (LF) Protein ELISA kit, Quantitative, 96 tests	LF Antigen	# 800-120-LF		

Anthrax PA83, LF, EF IgG/IgM negative and positive sera (human, cow, bison, deer, elk, mouse, goat, and sheep are also available. ADI also offers **custom testing of anthrax antigens or antibodies in human and animal samples**. ADI is also producing kits to measure PA83, EF or LF proteins in vaccines that are formulated in Alum or Alhydrogel. Please contact ADI.

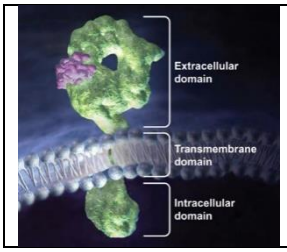
Anthrax Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

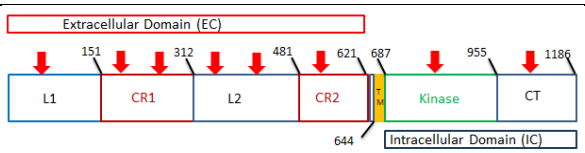
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2720

Item	Catalog#	Product Description	Product Type
Anthrax Receptors (ATR)	ATR11-A	Rabbit Anti-Human Anthrax Toxin Receptor 1, aff pure IgG # 1	Antibodies
	ATR12-A	Rabbit Anti-Human Anthrax Toxin Receptor 1, aff pure IgG # 2	Antibodies
	ATR31-A	Rabbit Anti-Human Anthrax Toxin Receptor 3, aff pure IgG #1	Antibodies
Cell wall	CWBA-1	Cell wall, semi 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
	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
	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	LF protease Inhibitor-1, Cell permeable, 14aa MEK2 analog, competitive inhibitor of LF	Peptide
	LFPS-1	LF Substrate 1, Internally quenched for monitoring LF protease activity (19aa)	Peptide
	LFPS-2	LF Protease Substrate 2, pNA derivative MEk2 peptide substrate (14aa)	Peptide
	LFPS-3	LF Protease Substrate 3, AMC derivative MEk2 peptide substrate (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
	PA16-A	Goat Anti-Protective Antigen 83 (PA83; B Anthracis) IgG	Antibodies
	PA17-A	Rabbit Anti-B. Anthracis Anthrax protective antigen 83 (PA83) (C-terminal peptide) IgG	Antibodies
	PA18-S	Rabbit Anti-B. Anthracis Anthrax protective antigen 83 (PA83) recomb. Protein antiserum	Antibodies
	PA20-R	Purified Recombinant Anthrax Protective Antigen (20 Kda)	Rec. Protein
	PA63-R	Purified Recombinant Anthrax Protective Antigen (63kD)	Rec. Protein
Spores	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
PA83 IgG control sera	900-100-02P	Human Anti-Anthrax Protective Antigen 83 (PA83) Protein IgG positive control	Disease Sera
	900-100-01N	Human Anti-Anthrax Protective Antigen 83 (PA83) Protein IgG negative control	Disease Sera
	900-120-02P	Human Anthrax Lethal Factor (LF) Protein IgG negative control	Disease Sera
	900-120-01N	Human Anti-Anthrax Lethal Factor (LF) Protein IgG negative control	Disease Sera

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. Breast cancer caused ~500,000 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. 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. 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. 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**) is a humanized monoclonal antibody that binds to Her2 protein and interferes with its functions. However, cancers usually develop resistance to trastuzumab. Approx. 70% of HER2+ patients do not respond to treatment. 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). 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).

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. **AE37 peptide** (776-790 aa) is a HER2/Neu-derived epitope linked to Ii-Key peptide (Ii-Key/HER2/neu hybrid peptide or AE37). **QIAKGMSYL** is a peptide, derived from the ECD of Her2. It is naturally presented by various HER2 positive cell lines.

Her2 Protein Vaccines: HER2 ICD (aa 676– 1255): 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. **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.

About ADI ELISA Kits: 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. 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.

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	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

(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	

Breast Cancer Vaccines: Antibody Recombinant Proteins, and Peptides

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

Catalog#	Product Description	Product Type
HER21-R-10	Recomb. (HEK) human Her2/Erbb2/Neu (1-652)-hIgG-Fc fusion protein	Protein
HER22-R-5	Recomb. (sf9) human Her2/Erbb2/Neu (676-1255)-GST fusion protein	Protein
HER23-R-10	Recomb. (HEK) human Her2/Erbb2/Neu (1-652)-his tag	Protein
HER24-R-10	Recomb. (HEK) mouse Her2/Erbb2/Neu (1-653)-his tag protein	Protein
HER25-R-10	Recomb. (HEK) mouse Her2/Erbb2/Neu (1-653)-hIgG1-Fc fusion	Protein
HER26-R-10	Recomb. (HEK) rat Her2/Erbb2/Neu (4-656)-his tag fusion protein	Protein
HER27-R-10	Recomb. (HEK) rat Her2/Erbb2/Neu (4-656)-his tag fusion protein	Protein
HER28-R-10	Recomb. (HEK) rat Her2/Erbb2/Neu (4-656)-hIgG1-Fc fusion protein	Protein
HER29-R-10	Recomb. (HEK) monkey/rhesus Her2/Erbb2/Neu (1-652)-his tag protein	Protein
HER30-R-10	Recomb. (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 Recomb. protein (1-652, extracellular domain), Recomb.	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 Recomb. protein (676–1255, intracellular domain), Recomb.	Protein

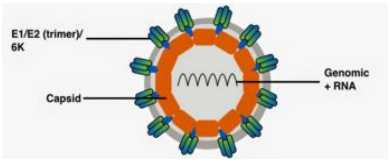
Catalog	Product Description	Product Type
HER2-776-P	HER2 peptide, (776 – 790 fused with LRMK, C-Term), GP2 vaccine candidate	peptides
HER2-MP1	HER2 multi peptide, (369-386, 688-703,971-984); vaccine candidate	peptides
HER2-MP2	HER2 multi peptide, (776-790,927-941,116-1180); vaccine candidate	peptides
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	Peptide
SP-52260-1	HER2/neu(654-662) GP2	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	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

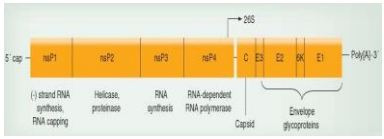
Chikungunya (CHIKV) Vaccines: ELISA Kits, Recombinant Proteins, and Antibodies

Chikungunya (for that which bens up) is a mosquito-borne viral disease first described during an outbreak in southern Tanzania in 1952. Animal reservoirs of the virus **include monkeys, birds, cattle, and rodents Chikungunya virus (CHIKV**), a member of the genus Alphavirus and the family Togaviridae, is the causative agent of chikungunya fever, which is characterized by fever, rash, myalgia, and arthralgia. Following the fever, strong joint pain or stiffness occurs; it usually lasts weeks or months, but may last for years. It is a member of the Semliki Forest virus complex and is closely related to Ross River virus, O'nyong'nyong virus, and Semliki Forest virus. Chikungunya and O'nyong nyong virus have 85% similarities in their genome. The O'nyong'nyong virus causes disease with symptoms very similar to chikungunya virus. CHIKV likely originated in Central/East Africa, where the virus has been found to circulate in a sylvatic cycle between forest-dwelling mosquitoes (A. aegypti and A. albopictus) and nonhuman primates. Currently, chikungunya fever has been identified in nearly 40 countries. CHIKV was one of more than a dozen agents listed as potential biological weapons.

CHIKV Diagnosis. Serological tests, such as ELISA, may confirm the presence of IgM and IgG anti-chikungunya antibodies (E1 and E2). Various reverse transcriptase–polymerase chain reaction (RT–PCR) methods are available but are of variable sensitivity. Virus isolation provides the most definitive diagnosis, but takes one to two weeks for completion and must be carried out in biosafety level III laboratories. There is no specific antiviral drug treatment for chikungunya.

Prevention and control relies heavily on reducing the number of natural and artificial water-filled container habitats that support breeding of the mosquitoes. This requires mobilization of affected communities. Basic precautions should be taken by people travelling to risk areas and these include use of repellents, wearing long sleeves and pants and ensuring rooms are fitted with screens to prevent mosquitoes from entering. Development of a CHIKV vaccine estimates a potential of 6 million doses per year. Since CHIKV is often misdiagnosed as dengue fever, increased surveillance and reporting may improve the understanding of disease burden, thus increasing the market potential.





CHIKV is an RNA virus with a positive-sense single-stranded genome (11.6kb). The 5' ORF encodes four nonstructural proteins that participate in genome replication, RNA capping, polyprotein cleavage and other functions required for viral replication. It is expressed via cap-dependent translation as an nsP1–3 or nsP1–4 polyproteins that is cleaved by an nsP2-encoded protease. The structural ORF polyprotein is eventually cleaved into the three main **structural proteins**: the capsid and the envelope glycoproteins E2 and E1, which form heterodimeric spikes on the viron surface. E2 binds to cellular receptors in order to enter the host cell through receptor-mediated endocytosis. The mature virion contains 240 heterodimeric spikes of E2/E1, which after release, bud on the surface of the infected cell, where they are released by exocytosis to infect other cells.

CHIKV Vaccines: There is **no commercial approved chikungunya vaccine**. A phase-II vaccine trial used a live, attenuated virus, to develop viral resistance in 98% of those tested after 28 days and 85% still showed resistance after one year. Virus-like particles (VLPs) based vaccine instead of attenuated virus is also in clinical trials. A vaccine containing key structural CHIKV genes into the MVA vaccinia virus or VSV-virus has shown promise in animal model. Natural infection results in lifelong immunity. Recombinant subunit vaccines using E or E1/E2 are also being tested.

About ADI's CHIKV ELISA Kits- ADI has produced CHIKV recombinant proteins (E1 and E2 and NS1) and developed ELISA kits to assess basal levels of CHIKV antibodies and to determine the efficacy of CHIKV vaccines or CHIKV -Chimeric vaccines. The use of highly purified recombinant proteins also allows the test to be more specific for CHIKV than similar kits using the whole viral proteins. ADI ELISA kits are rapid (105 min assay at room temp), sensitive (~ <1 ng/ml IgG or IgM), and quantitative.

CHIKV Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2937

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
CHIKV virus **Antibody ELISA kit, 96 tests, quantitative**	Human	530-400-CHG	530-410-CHM
CHIKV E1 **Antibody ELISA kits, 96 tests, quantitative**	Human	530-420-CEG	530-430-CEM
	Mouse	530-440-CEG	530-450-CEM
	Monkey	530-460-CEG	530-470-CEM
CHIKV E2 **Antibody ELISA kits, 96 tests, quantitative**	Human	530-500-CEG	530-510-CEM
	Mouse	530-520-CEG	530-530-CEM
	Monkey	530-540-CEG	530-550-CEM

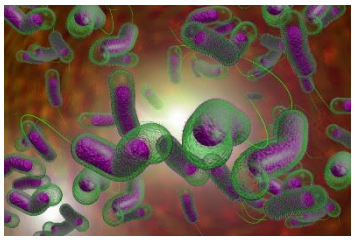
Chikungunya Virus Recombinant Proteins & Antibodies

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2937

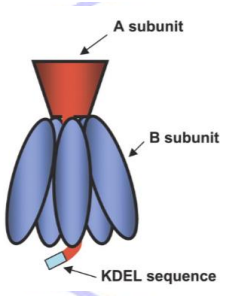
Catalog#	Product Description	Product Type
CHIKE15-R-10	Recomb (sf9) CHIKV E1 protein (Wild-type, ectodomain, 415-aa>95%, his-tag) for ELISA/Western	Recomb. Protein
CHIKE16-R-10	Recombinant (sf9) Chikungunya virus (CHIKV) E1 protein (A226V Mutant ectodomain, 415aa, >95%%, his-tag) for ELISA/Western	Recomb. Protein
CHIKE25-R-10	Recomb. (E. coli) CHIKV E2 protein (>95%%, ~45 kda, his-tag) for ELISA/Western	Recomb. Protein
CHIKC35-R-10	Recom. (E. coli) CHIKV capsid protein (>95%%, ~35 kda, his-tag) for ELISA/Western	Recomb. Protein
CHIKV11-M	Mouse Monoclonal Anti-Chikungunya virus (CHIKV) IgG, clone 1	Antibodies
CHIKV12-M	Mouse Monoclonal Anti-Chikungunya virus (CHIKV) IgG, clone 2	Antibodies
CHIKE11-A	Rabbit Anti-Chikungunya virus (CHIKV) E1 protein IgG	Antibodies
CHIKE21-A	Rabbit Anti-Chikungunya virus (CHIKV) E2 protein IgG	Antibodies
CHIKE31-A	Rabbit Anti-Chikungunya virus (CHIKV) Capsid protein IgG	Antibodies

Chikungunya-CHIKV-Vaccine-ELISA-Flr Rev. 160605A

Cholera Vaccines Antibody ELISA Kits, Recombinant Proteins, and Antibodies



Cholera is an infection of the small intestine by the bacterium **Vibrio cholerae**. Symptoms may range from none, to mild, to severe diarrhea. Vomiting and muscle cramps may also occur. Cholera spread mostly by water and food that has been contaminated with human feces containing the bacteria. Insufficiently cooked seafood is a common source. About 100 million bacteria must typically be ingested to cause cholera in a normal healthy adult. Humans are the only animal affected. Cholera has been found in two animal populations: shellfish and plankton. Prevention involves improved sanitation and access to clean water. The primary treatment is oral rehydration therapy—the replacement of fluids with slightly sweet and salty solutions, and antibiotic treatment. Cholera affects an estimated 3–5 million people worldwide and causes 58,000–130,000 deaths. Cholera is endemic in Africa and Asia; children are mostly affected. A rapid dipstick test is available to determine the presence of V. cholera.



Vibrio cholerae is a Gram-negative, comma-shaped bacterium. It has a flagellum at one cell pole as well as pili. V. cholerae has two circular chromosomes, together totaling 4 million base pairs of DNA sequence and 3,885 predicted genes. During infection, V. cholera secretes **cholera toxin (**choleragen and sometimes abbreviated to CTX, Ctx or CT) is a protein that causes diarrhea. The genes for cholera toxin are carried by CTXphi (CTXφ) and it can be from one V. cholerae strain to another. The cholera toxin is an oligomeric complex made up of six protein subunits: a single copy of the **A subunit** (28 kda, part A, enzymatic), and five copies of the **B subunit** (11 kda, part B, receptor binding), denoted as **AB5**. Subunit B binds while subunit A activates the G protein which activates adenylate cyclase. The B subunit ring of the cholera toxin binds to **GM1 gangliosides** on the surface of target cells. Once bound, the entire toxin complex is endocytosed by the cell and the cholera toxin A1 (CTA1) chain is released by the reduction of a disulfide bridge. CTA1 is then free to bind with a human partner protein called ADP-ribosylation factor 6. B subunit is relatively non-toxic.

Cholera vaccines are vaccines that are effective at preventing cholera. They are about 85% effective during the first six months and 50–60% effective during the first year. The first vaccines used against cholera were developed in the late 1800s. Oral vaccines were first introduced in the 1990s. The WHO as of late 2013 established a revolving stockpile of 2 million OCV doses. There are two variants of the oral vaccine currently in use: WC-rBS and BivWC. WC-rBS (marketed as "**Dukoral**") is a monovalent **inactivated vaccine** containing killed whole cells of V. cholerae O1 plus additional **recombinant cholera toxin B subunit**. BivWC (marketed as "Shanchol" and "mORCVAX") is a **bivalent inactivated vaccine** containing killed whole cells of V. cholerae O1 and V. cholerae O139. mORCVAX is only available in Vietnam. **Vaxchora** (PaxVax) (cholera vaccine, live, oral) is a vaccine indicated for active immunization against disease caused by Vibrio cholerae serogroup O1 in adults traveling to cholera-affected areas. The vaccine acts by inducing antibodies against both the bacterial components and CTB. The antibacterial intestinal antibodies prevent the bacteria from attaching to the intestinal wall, thereby impeding colonisation of V. cholerae O1. The anti-toxin intestinal antibodies prevent the cholera toxin from binding to the intestinal mucosal surface, thereby preventing the toxin-mediated diarrhoeal symptoms.

About ADI's Cholera Vaccine ELISA Kits: ADI has developed cholera toxin (CTB) antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. The kits can also be used to assess the basal immunity or vaccine induced antibodies in susceptible population. Cholera vaccine antibody ELISA kits for species or subtypes not listed can also be provided.

Cholera Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2729

Items Description	Species	Antibody Type IgA Cat#	Antibody Type IgG Cat#	Antibody Type IgM Cat#
Cholera Vaccine (CTB) Antibody ELISA kits, Quantitative	Human	945-100-CTA	945-110-CTG	945-120-CTM
	Mouse	945-130-CTA	945-140-CTG	945-150-CTM

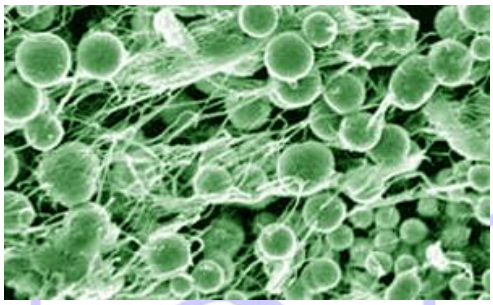
Adenovirus Related Antibodies and Reagents

Catalog#	Product Description	Product Type
CTOX11-C	Purified Cholera Toxin protein control for Western Blot	Western control
CTOX11-S	Rabbit Anti-Cholera Toxin protein antiserum	Antibodies
CTOX15-N-1000	Purified Cholera Toxin protein (antigen grade)	Pure Protein
CTOX15-N-500	Purified Cholera Toxin protein (antigen grade)	Pure Protein
CTOX16-C	Purified Cholera Toxin A Subunit protein control for Western Blot	Western control
CTOX16-N-100	Purified Cholera Toxin A Subunit protein	Pure Protein
CTOX16-S	Goat Anti-Cholera Toxin A Subunit antiserum	Antibodies
CTOX25-N-1000	Purified Cholera Toxin B Subunit (Choleragenoid) protein	Pure Protein
CTOX25-S	Rabbit Anti-Cholera Toxin B subunit antiserum	Antibodies
CTOX26-A	Rabbit Anti-Cholera Toxin B Subunit IgG	Antibodies
CTOX27-C	Purified Cholera Toxin B subunit protein control for Western Blot	Western control
CTOX27-M	Mouse Monoclonal Anti-Cholera Toxin B Subunit IgG	Antibodies
CTOX28-S	Goat Anti-Cholera Toxin B subunit (Choleragenoid) antiserum	Antibodies

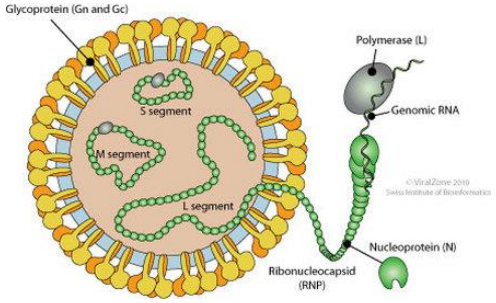
Cholera_Vaccine_Flr 160616A

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.

About ADI Congo Virus ELISA Kits: ADI has cloned, expressed and purified CCHFV nucleoprotein 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

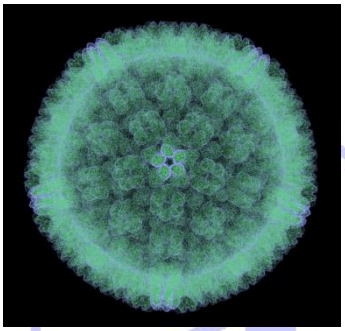
Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
Congo Virus Vaccine Crimean-Congo hemorrhagic fever virus (**CCHFV**) nucleoprotein antibody ELISA Kit	Mouse	AE-320400-1	AE-320410-1
	Human	AE-320420-1	AE-320430-1
	Rabbit	AE-320440-1	
	Bovine	AE-320450-1	

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 160604A

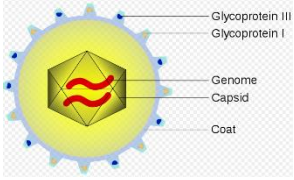
Human Cytomegalovirus (HCMV/CMV) Vaccines ELISA Kits, Recombinant Proteins, and Antibodies

Human cytomegalovirus (HCMV or HHV-5 or CMV) a member of a viral family known as Herpesviridae or herpesviruses. Within Herpesviridae, HCMV belongs to the Betaherpesvirinae subfamily, which also includes cytomegaloviruses from other mammals. HCMV infections are frequently associated with the salivary glands. HCMV infection is typically unnoticed in healthy people, but can be life-threatening for the immunocompromised, such as HIV-infected persons, organ transplant recipients, or newborn infants. Neonatal infection with CMV can lead to significant morbidity and even death. After infection, HCMV remains latent within the body throughout life and can be reactivated at any time. Eventually, it may cause mucoepidermoid carcinoma and possibly other malignancies such as prostate cancer.



HCMV is found throughout the world. It infects between 60% and 70% of adults in industrialized countries and almost 100% in emerging countries. Of all herpes viruses, HCMV harbors the most genes dedicated to altering (evading) innate and adaptive immunity in the host and represents a lifelong burden of antigenic T cell surveillance and immune dysfunction. Commonly it is indicated by the presence of antibodies in the general population. Seroprevalence is age-dependent: 58.9% of individuals aged 6 and older are infected with CMV while 90.8% of individuals aged 80 and older are positive for HCMV. Congenital HCMV is the leading infectious cause of deafness, learning disabilities, and intellectual disability in children.

ELISA is the most commonly available serologic test for measuring antibody to CMV. The result can be used to determine if acute infection, prior infection, or passively acquired maternal antibody in an infant is present. Other tests include various fluorescence assays, indirect hemagglutination, (PCR) and latex agglutination.



CMV is an enveloped dsDNA virus (~200 kb). Capsid consists of 162 capsomers and is surrounded by an amorphous tegument. Glycoproteins complexes are embedded in the lipid envelope. Attachment of the viral glycoproteins to host receptors mediates endocytosis of the virus into the host cell.

CMV Therapeutics and Vaccines: Cytomegalovirus Immune Globulin Intravenous (human) (**CMV-IGIV**) is an immunoglobulin G (IgG) containing a standardized number of antibodies to cytomegalovirus. It may be used for the prophylaxis of cytomegalovirus disease associated with transplantation of kidney, lung, liver, pancreas, and heart.

Vaccines: CMV vaccine is a vaccine to prevent CMV infection or to prevent it re-activation in those who are already infected. **No approved vaccine** available, although a number of vaccine candidates are under investigation. They include recombinant protein, live attenuated, DNA and other vaccines. Recombinant gB subunit CMV-vaccine reported an efficacy of 50% in seronegative women of childbearing age.

ADI has developed **antibody ELISA kits** to determine the efficacy of various existing vaccines and test new vaccines. These ELISA kits detects antibodies to several CMV proteins but antigen specific CMV ELISA kits can be developed on a custom basis. The CMV kits can also be used to assess potency of **CMV-IGIV**.

CMV Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2945

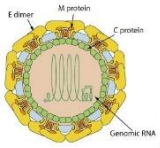
Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#	Antibody Type IgA Cat#
Human Cytomegalovirus (HCMV/CMV) Vaccines ELISA Kits,	Human	3300-370-CMG	3300-375-CMM	3300-380-CMA
	Monkey	3300-770-CMG	3300-775-CMM	3300-780-CMA

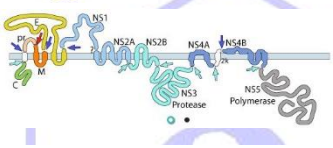
CMV Recombinant Proteins, Peptides and Antibodies

Catalog#	Product Description	Product Type
AB-23258-A	Rabbit Anti-Human cytomegalovirus (strain AD169) (HHV-5) (Human herpesvirus 5) Protein pp71 (UL82) IgG (aff pure)	Antibodies
AB-23258-P	Human cytomegalovirus (strain AD169) (HHV-5) (Human herpesvirus 5) Protein pp71 (UL82) Control/blocking peptide	peptides
MCGB11-C	Recomb.t (E. Coli) Mouse Cytomegalovirus (MCMV/MuHV-1) Glycoprotein B (gB) Protein Control for Western Blot	Western control
MCGB11-S	Rabbit Anti-Mouse Cytomegalovirus (MCMV/MuHV-1) Glycoprotein B (gB) Antiserum	Antibodies
MCGB15-R-10	Recomb. (E. Coli) Mouse Cytomegalovirus (MCMV/MuHV-1) Glycoprotein B (gB) Protein (his-tag, >95% Pure)	Pure protein
RP-1064	Recombinant (E.Coli) Cytomegalo Virus gB (11-67aa-GST tag)	Pure protein
RP-1065	Recombinant (E.Coli) Cytomegalo Virus pP28 (UL99)	Pure protein
RP-1066	Recombinant (E.Coli) Cytomegalo Virus Pp38 (UL80a)	Pure protein
RP-1067	Recombinant (E.Coli) Cytomegalo Virus pP52 (UL44)	Pure protein
RP-1068	Recombinant (E.Coli) Cytomegalo Virus pP65 (UL83)	Pure protein
RP-1069	Recombinant (E.Coli) Cytomegalo Virus pP150 (UL32)	Pure protein

Cytomegalovirus-Vaccine-Flr 160530A

Dengue fever, also known as **break bone fever**, is an infectious tropical disease caused by the dengue virus. Dengue symptoms include fever, headache, muscle and joint pains, and a characteristic skin rash that is similar to measles. Dengue is transmitted by several species of **mosquito** within the genus Aedes, principally A. aegypti. The virus has four different but related types (**DENV1-4**); 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.

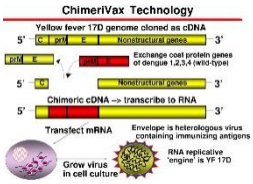




Dengue fever virus (**DENV**) is an RNA virus of the family Flaviviridae. Other members of the same genus include **yellow fever virus, West Nile virus, St. Louis encephalitis virus, Japanese encephalitis virus, tick-borne encephalitis virus, Kyasanur forest disease virus, and Omsk** hemorrhagic fever virus. The dengue virus genome code for the three structural proteins (**C, prM and E**) that form the virus particle and seven nonstructural proteins (NS1-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**.

Anima models for dengue research- Humans, some NHP, and mosquitoes are the only natural hosts. DENV replicates in NHP but does not cause disease. Immunodeficient mouse models (AG129, IFNα/β and IFNγ receptor deficient) exist but do not fully replicate human disease.

Dengue Vaccines: Approximately, **~400 million dengue infection** are reported every year. Vaccine development has been difficult due to the presence multiple dengue serotypes (DV1-4). Ideally, Dengue vaccine should provide protection from all serotypes. Several vaccine candidates are in development including **live attenuated**, **inactivated, DNA and subunit vaccines**. Live attenuated vaccine candidates are the furthest along in development. **Dengvaxia** (Sanofi), approved in 2015 (ChimeriVax, CYD-TDV) is a live attenuated tetravalent chimeric vaccine made using recombinant DNA



technology by replacing the **PrM (pre-membrane) and E (envelope)** structural genes of the yellow fever attenuated 17D strain vaccine with those from four of the five dengue serotypes. It incorporates nonstructural genes of yellow fever virus. Vaccine efficacy varied by serotypes (50-80%).

Dengue Vaccines in clinical trials: DENVax is a tetravalent, live-attenuated and recombinant vaccine candidate, combining nonstructural genes of serotype 2 with structural genes of serotypes 1, 3 and 4. **TetraVax-DV** is a tetravalent admixture of monovalent vaccines that were tested separately for safety and immunogenicity. **TDEN PIV** is a tetravalent vaccine is inactivated and purified, so that the genes of each serotype are not altered like V180, making it easier to produce. **V180** is a tetravalent recombinant subunit vaccine (Wild typed prM and truncated envelope protein) expressed in Drosophila cells. **DIME100** is recombinant subunit vaccines expressing Prm and envelope proteins of DENV1 under control of the human cytomegalovirus promoter/ enhancer of the plasmid vector VR1012. **TV003/TV005**: The NIH construct includes full-length wild type DENV-1, DENV-3 and DENV-4 viruses that are attenuated by 30 nucleotide deletions in the 3′ untranslated region, except DENV-3 which has an additional 31 nucleotide deletion in this region. The DENV-2 component of the vaccine is a chimeric virus with the prM and E proteins of wild type DENV-2 replacing those of DENV-4 in the DEN4 30 background.

About ADI's Dengue virus antibody ELISA kits - ADI has made recombinant dengue virus proteins (Capsid, Env, prM, and NS1), raised antibodies, and develop various ELISA kits to monitor the efficacy of various dengue vaccines. Most of the dengue vaccines are targeting the structural proteins (**prM and Env**), whereas others also have non-structural proteins as the active vaccine component. Therefore, it is necessary to pay attention to the vaccine desigen to determine how to determine the efficacy of the vaccines. For example, **Dengvaxia** vaccine efficacy should be tested by measuring the antibody titer of dengue prM and Env proteins in naïve and vaccinated individuals. Dengvaxia vaccine utilizes the YFV backbone. Therefore, it may help to determine the basal level of YFV antibodies to prM and Env and the non-structural protein NS1. High levels of YFV or other flaviviruses antibodies in naturally infected or vaccinated individuals may reduce the DengVaxia efficacy. The presence of Dengue NS1 antibodies in an individual may serve to distinguish naturally infected from the vaccinated ones (DIVA test).

Dengue Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2742

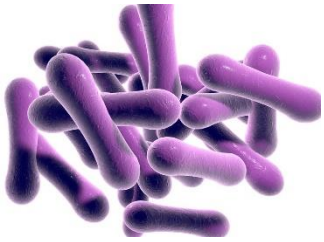
Virus	Target Antigens	ELISA Type	AbType	Human	Mouse	Monkey
Dengue	Whole virus	Ab	IgG	540-010-DHG		
			IgM	540-015-DHM		
	DV1/**Env**	Ab	IgG	540-100-ENG	540-110-ENG	540-120-ENG
	DV2/Env	Ab	IgG	540-200-ENG	540-210-ENG	540-220-ENG
	DV3/Env	Ab	IgG	540-300-ENG	540-310-ENG	540-320-ENG
	DV4/Env	Ab	IgG	540-400-ENG	540-410-ENG	540-420-ENG
	DV1/**Prm**	Ab	IgG	540-160-PRG	540-170-PRG	540-180-PRG
	DV2/Prm	Ab	IgG	540-260-PRG	540-270-PRG	540-280-PRG
	DV3/Prm	Ab	IgG	540-360-PRG	540-370-PRG	540-380-PRG
	DV1/Prm	Ab	IgG	540-460-PRG	540-470-PRG	540-480-PRG
	DV1+2+3+4 (Combo) **Env**	Ab	IgG	540-500-CEN	540-510-CEN	540-520-CEN
	DV1+2+3+4 (Combo) **Prm**	Ab	IgG	540-560-CPR	540-570- CPR	540-580- CPR

Dengue Vaccine Related ELISA kits

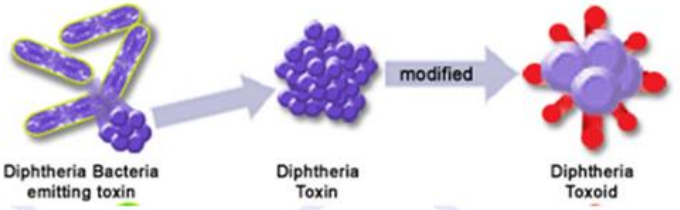
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2742

Type#	Catalog#	Product Description	Product Type
Dengue Type 1 (DV1)	DV1P15-P-100	Dengue Virus Type 1 prM synthetic peptide (>95%, no tag) for ELISA	Synthetic Protein
	DV1NS11-A	Dengue Virus Type 1 NS1 protein IgG, Aff pure	Antibodies
	DV1E31-M	Mouse Monoclonal Anti-Dengue Virus Type 1 ED3 (domain III) protein IgG	Antibodies
	DV1NS12-M	Mouse Monoclonal Anti-Dengue Virus Type 1 NS1 protein IgG	Antibodies
	DV1P11-A	Dengue Virus Type 1 prM IgG, Aff pure	Antibodies
	RP-1594	Recomb (E. coli) Dengue Type 1 E Antigen (DENV-E), (>95% 45 kda, no tag)	Recomb. Protein
	RP-1601	Recomb (insect cells) Dengue NS1 Type 1 protein (>95%, his-tag, ~45 kda)	Recomb. Protein
	RP-1602	Recomb (E.Coli) Dengue Type 1 envelop (domain I + II) protein (>95%, his-tag, ~32 kda)	Recomb. Protein
	RP-1605	Recomb (E.Coli) Dengue Virus Type 1 envelop protein (D-III) (>95%, ~15 kda, his-tag)	Recomb. Protein
	RP-1608	Recomb (E.Coli) Dengue Type 1 envelop N-terminus immunodominant regions (>95%, ~22 kda, his-tag)	Recomb. Protein
	RP-344	Recomb Dengue Virus Type 1 NS3 protein (29-79 aa)	Recomb. Protein
Dengue Type 2 (DV2)	AB-14310	Mouse Anti-Dengue Virus Type 2 envelop IgG, aff pure	Antibodies
	AB-21123	Monoclonal Anti-Dengue Virus Type 2, NS1 IgG	Antibodies
	DV2C11-A	Anti-Dengue Virus Type 2, capsid protein IgG	Antibodies
	DV2C15-R-10	Recomb (E.coli) Dengue type 2 Capsid Protein (New Guinea C, 1-118 aa, ~14 kda, his-tag)	Rec. Protein
	DV2NS11-A	Anti-Dengue Virus Type 2, NS1 (full length) protein IgG	Antibodies
	DV1P25-P-100	Dengue Virus Type 2 prM synthetic protein (>95%, no tag) for ELISA	Synthetic Protein
	DV2E21-M	Mouse Monoclonal Anti-Dengue Virus Type 2 Envelop protein IgG	Antibodies
	DV2NS21-A	Dengue Virus Type 2 NS1 protein IgG, Aff pure	Antibodies
	DV2NS22-M	Mouse Monoclonal Anti-Dengue Virus Type 2 NS1 protein IgG	Antibodies
	DV2P21-A	Dengue Virus Type 2 prM IgG, Aff pure	Antibodies
	DV2P22-A	Dengue Virus Type 2 prM peptide (1-91aa) IgG, Aff pure	Antibodies
	RP-1607	Recomb (E. Coli) Dengue Type 2 NS1 protein (>95%, ~45 kda, his-tag)	Recomb. Protein
	RP-1595	Recomb (E. coli) Dengue Type 2 Env Antigen (CT DIII, 15 kda) (>95%, his-tag)	Recomb. Protein
	RP-1598	Recomb. (E. coli) Dengue Type 2 (and epitopes for type 1, and 3) E Antigen (DENV E) (23 kda, >95% pure)	Recomb. Protein
	RP-1620	Recomb. (E. coli) Dengue Virus Type 2 NS1 protein (>95%, his-tag)	Recomb. Protein
	RP-1639	Recomb. (E. coli) Dengue Virus Type 2 prm protein (>95%, 18 kda, his-tag)	Recomb. Protein
	RP-1641	Recomb. (E. coli) Dengue Virus Type 2 envelop protein (>95%, 43-413aa, ~45 kda, his-tag)	Recomb. Protein
	RP-1644	Recomb. (E.Coli) Dengue Type 2 envelop (domain I + II) protein (>95%, his-tag, ~32 kda)	Recomb. Protein
	RP-1647	Recomb. (sf9) Dengue type 2 Envelope Protein (New Guinea ECD 247-675aa, ~50 kda, his-tag), low endotoxin	Recomb. Protein
	RP-345	Recomb. (E.Coli) Dengue Virus 2 NS1 c-end (>95%, C-terminal regions ~122 aa, his-tag)	Recomb. Protein
	RP-346	Recomb. (E. Coli) Dengue Virus 2 NS1 protein (>95%, N-terminal regions, his-tag)	Recomb. Protein
	SP-100796-1	2A/2B Dengue Protease Substrate [Ac-Arg-Thr-Ser-Lys-Lys-Arg- pNA; MW: 937.08]	Pure Peptide
	SP-100797-1	2B/3, Dengue Protease Substrate [Ac-Glu-Val-Lys-Lys-Gln-Arg- pNA; MW: 949.09]	Pure Peptide
Dengue Type 3 (DV3)	DV1P35-P-100	Dengue Virus Type 3 prM synthetic peptide (>95%, no tag) for ELISA	Synthetic Protein
	DV3P31-A	Dengue Virus Type 3 prM IgG, Aff pure	Antibodies
	DV3NS31-A	Dengue Virus Type 3 NS1 protein IgG, Aff pure	Antibodies
	DV3NS32-M	Mouse Monoclonal Anti-Dengue Virus Type 3 NS1 protein IgG	Antibodies
	DV4P41-A	Dengue Virus Type 4 prM IgG, Aff pure	Antibodies
	RP-1596	Recomb. (E. coli) Dengue Type 3 E Antigen (DENV-E), antigen grade (>95%, 15 kda, no tag)	Recomb. Protein
	RP-1600	Recomb. (E. Coli, his-tag) Dengue Type 3 NS1 protein (>95%, his-tag, ~45 kda)	Recomb. Protein
	RP-1642	Recomb. (E. coli) Dengue Virus Type 3 envelop protein (>95%, ~45 kda, his-tag)	Recomb. Protein
	RP-1645	Recomb. (E.Coli) Dengue Type 3 envelop (domain I + II) protein (>95%, his-tag, ~32 kda)	Recomb. Protein
	RP-1646	Recomb. (E.Coli) Dengue Type 3 envelop (domain I + II) protein (>95%, his-tag, ~32 kda)	Recomb. Protein
	SP-100800-1	3/4A, Dengue Protease Substrate [Ac-Phe-Ala-Ala-Gly-Arg-Lys- pNA; MW: 810.9]	Pure Peptide
	RP-1603	Recomb. (E.Coli) Dengue Virus Type 3 envelop protein (D-III) (>95%, ~15 kda, his-tag)	Recomb. Protein
Dengue Type 4 (DV4)	DV1P45-P-100	Dengue Virus Type 4 prM synthetic peptide (>95%, no tag) for ELISA	Synthetic Protein
	DV4NS41-A	Dengue Virus Type 4 NS1 protein IgG, Aff pure	Antibodies
	DV4NS42-M	Mouse Monoclonal Anti-Dengue Virus Type 4 NS1 protein IgG	Antibodies
	RP-1597	Recomb. (E. coli) Dengue Type 4 E Antigen (DENV-E) (>95%, 15 kda, no tag)	Recomb. Protein
	RP-1599	Recomb. (E. Coli, his-tag) Dengue Type 4 NS1 protein (>95%, his-tag, ~45 kda)	Recomb. Protein
	RP-1604	Recomb. (E.Coli) Dengue Virus Type 4 envelop protein (D-III) (>95%, ~15 kda, his-tag)	Recomb. Protein
	RP-1606	Recomb. (E.Coli) Dengue Type 1+2+3+4 Envelop immunodominant regions (>95%, ~22 kda, his-tag)	Recomb. Protein
	RP-1643	Recomb. (E. coli) Dengue Virus Type 4 envelop protein (>95%, ~45 kda, his-tag)	Recomb. Protein
DV1-4	AB-21120	Anti-Dengue Type 1-4 viruses antisera	Antibodies
	AB-21121	Monoclonal Anti-Dengue Virus Type 1-4 (pan, E antigen) IgG, culture medium	Recomb. Protein
	AB-21122-1	Monoclonal Anti-Dengue Virus Type 1-4 (pan, NS1) IgG	Antibodies
	AB-21122-2	Monoclonal Anti-Dengue Virus Type 1-4 (pan, NS1) IgG, clone 2 (pairs with clone 1)	Antibodies

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. Common diphtheria has largely been eradicated in industrialized nations through widespread vaccination. **DPT (Diphtheria–Pertussis–Tetanus) vaccine** is recommended for all school aged children. **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.

About ADI's Diphtheria ELISA Kits - It is necessary to monitor the efficacy of vaccines and determine immune status of population in normal and vaccinated individuals. ADI has developed Diphtheria antibody ELISA Kits for humans and animals that will be useful to determine the efficacy of various existing Diphtheria vaccines and test new vaccines. Non-toxic CRM197 protein is also used as a carrier protein in other vaccines. Antibody ELISA kits for CRM197 are also available. ADI has also introduced **industry's first ELISA for direct testing of Diphtheria Toxoid adsorbed on Alum** (for vaccine identification and testing).

Diphtheria Related ELISA Kits**vaccine** Related ELISA kits

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

Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Monkey	Rabbit	Others
Diphtheria	Toxin/Toxoid	Ab	IgA	940-090-DHA				
			IgG	940-100-DHG	940-120-DMG	940-240-DKG	940-130-DRG	940-140-DGG (Gp)
			IgM		940-125-DMM	940-245-DMM	940-135-DRM	940-145-DGG (Gp)
	CRM197 /Toxoid	Ab	IgG	940-200-DHG	940-220-DMG	940-240-DKG	940-230-DRG	
			IgM	940-210-DHM	940-225-DMM	940-245-DKM	940-235-DRM	
		Ag		940-DTX-AG1	Diphtheria Toxoid/Toxin (DTX) Vaccine ELISA for the measurement DTX in biological buffer			
	DTX/Alum	Ag		VAC-DTX-50	VacciGel Direct ELISA for the measurement of Diphtheria Toxoid in Vaccines formulated in Alum			

Diphtheria Related Antibodies and Proteins

Catalog#	Product Description	Product Type
CRM1972-S	Anti-Diphtheria toxin cross-reactive material 197 (CRM197) protein antiserum #1	Antibodies
CRM1972-S	Anti-Diphtheria toxin cross-reactive material 197 (CRM197) protein antiserum #2	Antibodies
CRM197-N-100	Purified CRM197 (Diphtheria Toxin mutant) protein (antigen grade)	Pure Protein
DTOX11-S	Anti-Diphtheria Toxoid/Toxin IgG, unlabeled	Antibodies
DTOX12-B	Anti-Diphtheria Toxoid/Toxin IgG-Biotin conjugate	Antibodies
DTOX12-F	Anti-Diphtheria Toxoid/Toxin IgG-FITC conjugate	Antibodies
DTOX12-HRP	Anti-Diphtheria Toxoid/Toxin IgG-HRP conjugate	Antibodies
DTOX12-S	Anti-Diphtheria Toxoid/Toxin IgG, unlabeled	Antibodies
DTOX13-M	Monoclonal Anti-Diphtheria Toxin/Anatoxin IgG #1, unlabeled	Antibodies
DTOX14-M	Monoclonal Anti-Diphtheria Toxin/Anatoxin IgG #2, 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/Toxoid (non-reactive with free A/B subunits) IgG, unlabeled	Antibodies
DTOX16-N-500	Purified Diphtheria Toxoid protein (cGMP/USP, vaccine grade, ~1500-2500 Lf/ml; Low endotoxin)	Pure Protein
DTOX16-N-B	Purified Diphtheria Toxoid protein (cGMP/USP, vaccine grade, ~1500-2500 Lf/ml, low endotoxin)	Pure Protein
DTOX16-S	Anti-Diphtheria Toxoid/Toxin antiserum	Antibodies
DTOX17-Fab2	Anti-Diphtheria Toxoid/Toxin IgG (Fab2)	Antibodies

Ebola & Marburg Virus Vaccine ELISA Kits, Recombinant Proteins, and Antibodies

Alpha Diagnostic Intl Inc. (ADI) has developed many prototype vaccines and ELISA tests to determine the efficacy of Ebola candidate vaccines in animals and humans. We have cloned and expressed several Ebola viral proteins (GP, NP, and VP40) from Ebola/Marburg viruses, generated antibodies, and developed ELISA kits for the detection and measurement of Ebola related antigens and antibodies. ADI's Ebola kits contain all animal derived antibodies made to purified recombinant proteins. ADI antibodies and kits have no Ebola virus or viral derived proteins and are completely safe to use and transport. The kits have been tested and validated with therapeutic antibodies, Zmapp. Additional ELISA kits and antibodies are available for Ebola vaccine vectors (Adenovirus, VSV, and Rabies virus proteins) to determine efficacy of Ebola vaccines.

Zaire-Ebola vaccine Related ELISA kits

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

Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Monkey	Rabbit	Others
Ebola	Zaire-NP	Ab	IgG	AE-320620-1	AE-320600-1	AE-320650-1	AE-320640-1	
			IgM	AE-320630-1	AE-320610-1	AE-320660-1		
	Zaire-GP	Ab	IgG	AE-320620-1	AE-320600-1	AE-320650-1	AE-320640-1	
			IgM	AE-320630-1	AE-320610-1	AE-320660-1		
	Zaire-VP40	Ab	IgG	AE-320720-1	AE-320700-1	AE-320750-1	AE-320740-1	
			IgM	AE-320730-1	AE-320710-1	AE-320760-1		
	Humanized	Ab	#AE-320810; Humanized (plant expressed) Anti-Ebola GP IgGs ELISA kit					
			#AE-320800-48; Zaire Ebola Virus Glycoprotein (EBOV GP antigen) ELISA Kit					
			#AE-320815; Anti-Humanized Ebola GP IgGs (Anti-drug antibody/ADA) ELISA kit					
	Sudan-NP	Ab	IgG	AE-321620-1	AE-321600-1	AE-321650-1	AE-321640-1	
			IgM	AE-321630-1	AE-321610-1	AE-321660-1		
	Sudan-GP	Ab	IgG	AE-321620-1	AE-321600-1	AE-321650-1	AE-321640-1	
			IgM	AE-321630-1	AE-321610-1	AE-321660-1		
	Reston-Gp	Ab	IgG	AE-321620-1		AE-321630-1		Sw, Gp
	Combo-GP	Ab	IgG	AE-325600-XH		AE-325600-XM	Zaire+Sudan+Reston+Bundibugyo	
Ebola/Marburg	Marburg-GP	Ab	IgG	AE-321620-1	AE-321600-1	AE-321650-1		
			IgM	AE-321630-1	AE-321610-1	AE-321660-1		
	Angola-GP	Ab	IgG	AE-322620-1	AE-322600-1	AE-322650-1		
			IgM	AE-322630-1	AE-322610-1	AE-322660-1	AE-322640-1	
	Tai Forest-GP	Ab	IgG	AE-325620-1				

Note: additional ELISA kits for pig, G. pig, dog and other species also available. Please contact ADI. All of the above ELISA kits are for research use only (RUO) and not for diagnostic, therapeutic or prevention of the disease.

Ebola Vaccine/Vector ELISA kits

There is a critical and immediate need for new **Ebola vaccines**. WHO has recommended two candidate vaccines for clinical testing. One (**cAd3-ZEBOV**) has been developed by GlaxoSmithKline (GSK) in collaboration with the US National Institute of Allergy and Infectious Diseases (NIAID). It uses a chimpanzee-derived adenovirus vector with an Ebola virus gene inserted. The second (**rVSV-ZEBOV**) was developed by the Public Health Agency of Canada in Winnipeg. The license for commercialization of the Canadian vaccine is held by an American company, the NewLink Genetics Company, located in Ames, Iowa. The vaccine uses an attenuated or weakened vesicular stomatitis virus Indiana (VSVI), a pathogen found in livestock; one of its genes has been replaced by an Ebola virus gene. The trials, which are being conducted in healthy human volunteers, are designed to test safety and immunogenicity and select the appropriate dose. Positive results have been reported from both vaccines (refs 1).
References: (1) http://www.nature.com/news/us-ebola-vaccine-trial-reports-positive-results-1.16417;

Type	Product Description	Ab Type	Mouse	Human	Monkey/Chimp
New AD5 Vaccines	Adenovirus hexon antibody ELISA Kits**	IgG	AE-327100-1	AE-327110-1	AE-327120-1
rVSV vaccines	VSV Indiana Matrix (M) antibody ELISA Kits**	IgG	AE-327200-1	AE-327210-1	AE-327220-1
	VSV Indiana Glycoprotein antibody ELISA Kits**	IgG	AE-327300-1	AE-327310-1	AE-327320-1

Rabies or vaccinia virus vector ELISA kits are also available.
http://4adi.com/commerce/ccc2726-rabies-vaccine-elisa-and-reagents-rabies-vaccine--elisa-reagents.htm
http://4adi.com/commerce/ccc2745-vaccinia-virus-based-vaccines-and-elisa-kits-vaccinia-virus--vaccines--elisa-kits0d0a.htm

Zaire-Ebola vaccine Related Antibodies, Proteins and other Reagents

Virus Type	Protein	Catalog#	Product Description	Product Type
Bundibugyo	GP1/2 RBD	BVGP45-R-10	Recomb. (sf9) Bundibugyo **GP** (Uganda 2007,1-501aa, his tag, >95%)	Rec. protein
		BVRB46-R-10	Recomb. (HEK) Bundibugyo GP **RBD domain** (hIgG1-Fc-tag at CT)	Rec. protein
		BVRB46-BTN	Biotin-Recomb. (HEK) Bundibugyo GP **RBD domain** (hIgG1-Fc-tag at CT)	Rec. protein
Zaire Ebola	**Glycoprotein** GP1/2	EVGP15-A	Rabbit Anti-Zaire Ebola virus **glycoprotein** (1-676aa/DNA vaccine) IgG	Antibodies
		EVGP16-A	Rabbit Anti-Zaire Ebola virus **glycoprotein** (1-652aa/DNA vaccine) IgG	Antibodies
		EVGP20-R-10	Recomb. (sf9) Zaire EVGP (GIN/2014/Makona-C15, 1-650aa, his-tag at CT)	Rec. protein
		EVGP21-R-10	Recomb. (HEK) Zaire EVGP (GIN/2014/1-650aa, his-tag at CT, >95%), Low endotoxin	Antigen protein
		EVGP22-A	Goat Anti-Zaire Ebola virus (Mayinga) glycoprotein (ZEBOV GP) IgG,	Antibodies
		EVGP31-R-10	Recomb. (HEK) Zaire EV**GP** (Mayinga, 1-650aa, his-tag at CT, >95%)	Rec. protein
		EVGP31-BTN	Biotin-Recomb. (HEK) Zaire **EVGP** (Mayinga, 1-650aa, his-tag at CT)	Rec. protein
	GP1	EVGP33-R-10	Recomb. (HEK) Zaire EVGP1 (GIN/2014/ GP1, 1-501aa, his-tag, >95%)	Rec. protein
		EVGP18-R-10	Recomb. (sf9) Zaire EVGP**1** (GIN/2014/ Makona 1-501aa, his-ta at CT)	Rec. protein
	GP2	EVGP32-R-10	Rec. (HEK) Zaire EVGP2 (GIN/2014/ Makona, **GP2**, 501-650aa, mFc-tag)	Rec. protein
	GP/RBD	EVRB11-R-10	Recomb. (HEK) **Zaire** EVGP **RBD domain** (1-308aa, GIN/2014/, **his-tag at CT)**	Rec. protein
		EVRB11-BTN	Biotin- Rec. (HEK) **Zaire** EVGP-**RBD domain** (1-308aa, GIN/2014/**his-tag at CT)**	Rec. protein
		EVRB14-R-10	Recomb. (HEK) Zaire EVGP **RBD** domain (Mayinga 1-308 aa, his tag)	Rec. protein
		EVRB14-BTN	Biotin- Recomb. (HEK) Zaire EVGP-**RBD** domain (Mayinga, 1-308 aa, his tag, >95%)	Rec. protein
		EVNP11-S	Rabbit Anti-Zaire-Ebola virus **NP** (Mayinga EBOV NP) protein antiserum	Antiserum
		EVNP13-A	Rabbit Anti-Zaire Ebola virus **NP** (EBOV NP, 1-739/DNA vaccine) IgG	Antibodies
		EVNP15-R-10	Recomb. (E.coli) Zaire Ebola **NP** (full length, his-tag, 82 kda), purified	Rec. protein
		EVNP16-R-10	Recomb. (E.coli) EBOV NP) (GIN/2014/Kissidougou-C15, 630-739aa, his-tag, >95%)	Rec. protein
	VP24	EVP24-R-10	Recomb. (E.coli) Zaire Ebola virus **VP24** (1-233aa, his tag, >95%)	Rec. protein
	VP40	EVP404-A	Goat Anti-Zaire-Ebola virus (Mayinga) VP40 (ZEBOV VP40) IgG, purified	Antibodies
		EVP406-R-10	Recomb. (E.coli) Zaire Ebola virus **VP40** (GIN/2014/ 1-326 aa, his-MBP tag, >95%)	Rec. protein
		EVP406-BTN	Biotin-Recomb. (E.coli) Zaire Ebola virus **VP40** (GIN/2014/ 1-326 aa, his-MBP tag, >95%)	Rec. protein
	Virus	EVZ12-M	Mouse Monoclonal Anti-Zaire Ebola virus (killed) IgG, aff pure	Antibodies
		EVZ13-M	Mouse Monoclonal Anti-Zaire Ebola virus (Killed) IgG, aff pure	Antibodies
		EVZ14-M	Mouse Mono Anti-Zaire Ebola virus IgG (mixture of EVZ12-M and EVZ13-M)	Antibodies
	Peptides	SP-89925-1	Zaire Ebola virus Glycoprotein (GP), T cell epitope (577-584) (MW: 966.1)	Pure peptide
		SP-89926-1	Zaire Ebola virus negative control peptide for SP-89925-1 (MW: 1102.2)	Pure peptide
Sudan Ebola	Glycoprotein/GP	SVGP24-R-10	Recom. (HEK) Sudan-Ebola virus **GP** (Gulu, 1-637aa, his-tag at CT, >95%	Rec. protein
		SVGP24-BTN	Biotin-Recom. (HEK) Sudan-Ebola virus **GP** (Gulu, 1-637aa, >95%, his-tag	Rec. protein
		SVGP29-R-10	Rec. (HEK) Sudan-Ebola virus **GP** (Uganda, 1-637aa, his-tag at CT, >95	Rec. protein
	GP1 /RBD Domain	SVGP28-R-10	Rec. (HEK) Sudan Ebola virus **GP 1** (Uganda, 1-501aa, his-tag, >95%)	Rec. protein
		SVRB11-R-10	Rec. (**HEK**) Sudan-EVGP **RBD domain** (Uganda-00/1-320aa, his-tag)	Rec. protein
	NP	SVNP27-R-10	Recomb. (E.coli) Sudan **EBOV NP** (Uganda, 630-738aa, his-tag, >95%)	Rec. protein
	VP40	SVP407-R-10	Recomb. (E. coli) Sudan **VP40** (Uganda,1-326aa, his tag, >95%)	Rec. protein
		SVP408-R-10	**Rec.** (E. coli) Sudan **VP40** (Uganda,1-326aa, his-MBP tag at NT, >95%)	Rec. protein
Reston	RVGP	RVGP31-A	Rabbit anti-Reston GP) peptide IgG aff pure	Antibodies
		RVGP35-R-10	Recomb. (sf9) **REBOV GP** minus transmembrane domain, his-tag, 72 kda), purified	Rec. protein
		RVGP35-R-100	Recomb. (sf9) **REBOV GP** minus transmembrane domain, his-tag, 72 kda), purified	Rec. protein
New Tai Forest	TAFV GP	TVGP55-R-10	Rec. (E. coli) Tai Forest Ebola virus glycoprotein (**TAFV GP** his-tag), purified	Rec. protein
		TVGP51-S	Rabbit anti-TAFV GP antiserum	Antibodies
Marburg	MARV-GP	MVGP12-A	Rabbit Anti-Marburg virus glycoprotein peptide (MARV GP) IgG, aff pure	Antibodies
		MVGP13-M	Mouse Monoclonal Anti-Marburg virus glycoprotein (MARV GP) IgG, purified	Antibodies
		MVGP15-R-10	Recomb. (sf9) Marburg virus glycoprotein (Angola, his-tag, >95%), purified	Antibodies
		MVGP16-BTN	Biotin-Recomb. (sf9) Marburg virus glycoprotein (Musoke, HA-tag, >95%), purified	Antibodies
		MVGP16-R-10	Recomb. (sf9) Marburg virus glycoprotein (Musoke, HA-tag, >95%), purified	Antibodies
		MVGP17-A	Rabbit Anti-MARV GP 26-649 aa/Muskoe/DNA vaccine) IgG, aff pure	Antibodies
		MVGP18-A	Rabbit Anti-MARV GP 26-649 aa/Popp/DNA vaccine) IgG, aff pure	Antibodies

Adenovirus, Rabies and VSV are being used to express Ebola genes (vaccines). ADI has many antibodies, recombinant proteins and ELISA kits for these vectors.

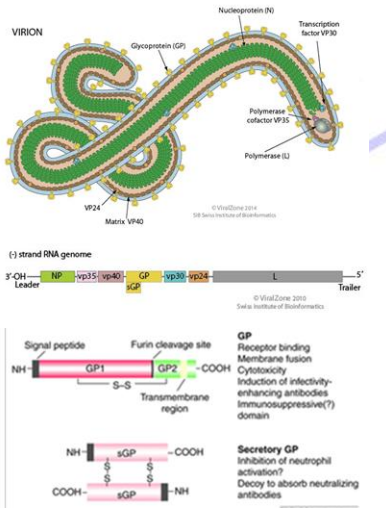
Ebola_Marburg_Vaccines_ELISA_Flr 160605A

Ebola Virus –General Information, Therapeutics and Vaccines

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, and order Mononegavirales. The family Filoviridae (members are called Filovirus or filovirids; filum is derived from latin meaning filamentous) is a group of several related viruses that form filamentous infectious viral particles (virions) and encode their genome in the form of single-stranded negative-sense RNA. The family currently includes the three virus genera Cuevavirus, Ebolavirus, and Marburg virus. The family members are:

Genus name	*Species name*	*Virus name (Abbreviation)*
Cuevavirus	*Lloviu cuevavirus**	Lloviu virus (LLOV)
Ebolavirus	*Bundibugyo ebolavirus*	Bundibugyo virus (BDBV; previously BEBOV)
	Reston ebolavirus	Reston virus (RESTV; previously REBOV)
	Sudan ebolavirus	Sudan virus (SUDV; previously SEBOV)
	Taï Forest ebolavirus	Taï Forest virus (TAFV; previously CIEBOV)
	*Zaire ebolavirus**	Ebola virus (EBOV; previously ZEBOV)
Marburgvirus	*Marburg marburgvirus**	Marburg virus (MARV)

The two members of the family that are commonly known are Ebola virus and Marburg virus. Both viruses, and some of their lesser known relatives, cause severe disease in humans and nonhuman primates (NHP) in the form of viral hemorrhagic fevers. All Ebola viruses and Marburg viruses are Select Agents Group 4 Pathogens. Filoviruses have a history that dates back several tens of millions of years. The most recent common ancestor of both the Reston and Zaire species has been estimated to be ~1960. The most recent common ancestor of the Marburg and Sudan species appears to have evolved 700 and 850 years before present respectively. The family Filoviridae represents significant health risks as emerging infectious diseases as well as potentially engineered biothreats. Ebolavirus species Zaire (ZEBOV) causes a highly lethal hemorrhagic fever, resulting in the death of 90% of patients within days. 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 of them 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, then assembling in the cell.

Ebola virus disease (EVD) is clinically indistinguishable from **Marburg virus disease (MVD)** and can be easily be confused with many other diseases prevalent in Equatorial Africa, such as other viral hemorrhagic fevers, falciparum malaria, typhoid fever, shigellosis, and 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 Ebola virus-induced disease.

Experimental Drugs and Vaccines (ZMapp, Favipravir, TKM-Ebola etc)

From 1976 (when it was first identified) through 2013, the WHO reported a total of 1,716 cases. The largest outbreak to date is the ongoing 2014 West Africa Ebola outbreak, which is affecting Guinea, Sierra Leone, Liberia and Nigeria. As of 26 August 2014, 3,069 suspected cases resulting in the deaths of 1,552 have been reported. Currently, neither a specific treatment nor a vaccine licensed for use in humans is available. However, a number of vaccine candidates have been developed in the last decades that are highly protective in non-human primates. Among these vaccines are recombinant Adenoviruses (Ad5/chAd3), recombinant Vesicular Stomatitis viruses (VSV), recombinant Human Parainfluenza viruses and virus-like particles. There is sufficient evidence from studies in animal studies and NHP (non-human primates) that a vaccine protective against ebolaviruses is possible.

Ebola Therapeutics

The FDA has allowed two drugs, **ZMapp** and an RNA interference drug called **TKM-Ebola**, to be used in people infected with Ebola under these programs during the 2014 outbreak. **ZMapp**, the top-secret magic serum, is an experimental biopharmaceutical drug comprising three humanized monoclonal antibodies (anti-Zaire Ebola GP) under development as a treatment for Ebola virus disease. The ZMapp drug is being developed by Mapp Biopharmaceutical Inc., a result of the collaboration between Mapp Biopharmaceutical (San Diego), LeafBio (the commercial arm of Mapp Biopharmaceutical), Defyrus Inc. (Toronto), the U.S. government and the Public Health Agency of Canada. ZMapp is composed of three monoclonal antibodies (mAbs) that have been humanized by genetic engineering and combine "the best components of MB-003 (Mapp) and ZMAb (Defyrus/PHAC)", each of which were combinations of mAbs. Zmapp components are humanized monoclonal antibody c13C6 from MB-003 and two

humanized mAbs from ZMab, c2G4 and c4G7. Like intravenous immunoglobulin therapy, ZMapp contains neutralizing antibodies that provide passive immunity to the virus by directly and specifically reacting with virus GP in a "lock and key" fashion. ZMapp is manufactured in the tobacco plant Nicotiana benthamiana in the bioproduction process known as "pharming" by Kentucky BioProcessing, a subsidiary of Reynolds American. **ADI has developed the first rapid ELISA kit to measure the activity or potency of the drug during its manufacturing. The kit also allows the measurement of active drug in serum or plasma of animals or humans**.

TKM-Ebola is being developed by Tekmira Pharmaceuticals Corp., a company located in Vancouver, Canada. The drug was formerly known as Ebola-SNALP. It is a combination of Small interfering RNAs (siRNAs) targeting three of the seven proteins in Ebola virus: Zaire Ebola L polymerase, Zaire Ebola membrane-associated protein (VP24), and Zaire Ebola polymerase complex protein (VP35), formulated with Tekmira's lipid nanoparticle technology. ADI has produced recombinant proteins, antibodies, and antibody ELISA kits to research the efficacy of TKM-Ebola therapy.

Current and Future Ebola Vaccines

A number of vaccines have been successfully tested in animals and NHP. Human safety studies of an experimental **Ebola vaccine developed by the National Institutes of Health (NIH) and GlaxoSmithKline will** launch in September 2014. NIH is also working with Crucell, Profectus Biosciences, Immunovaccine and researchers at Thomas Jefferson University to develop other candidate vaccines for Ebola. Human trials of the Crucell vaccine are planned for late 2015 or early 2016. Another experimental **Ebola vaccine, VSV-EBOV**, has been developed by the Public Health Agency of Canada and is licensed to NewLink Genetics. The clinical trials are expected to begin soon. NIAID also is funding Profectus Biosciences, a Baltimore, Maryland-based biotechnology company, to develop a candidate vaccine targeting **Ebola and Marburg infections**. The vaccines is based upon recombinant vesicular stomatitis Indiana virus (rVSV) vectored vaccines for EBOV and MARV glycoproteins (rVSV vector-GP construct (delta G1,2). This highly attenuated genetically modified rVSV vector is a replicating virus with good immunogenicity and low virulence. This strategy may mitigate the risk of poor of immunogenicity in vaccine recipients with immunologic memory to vector variants delivered in previous vaccinations. This vaccine is currently in preclinical testing.

Human trials of the candidate Ebola vaccine, co-developed by the US National Institutes of Health (NIH) and GlaxoSmithKline (GSK), are scheduled to start in September 2014 in the UK, The Gambia and Mali. The candidate vaccine is against the Zaire species of Ebola, which is the one circulating in West Africa, and uses a single **Zaire Ebola virus glycoprotein protein (GP)** to generate an immune response. NIAID is testing this same vaccine in the USA (**VRC 207 study**) in addition to a related vaccine that is designed to protect against two Ebola species (**Ebola Zaire and Ebola Sudan**). The NIAID/GSK Ebola vaccine candidate is based on an attenuated strain of chimpanzee cold virus, called chimp adenovirus type 3 (**ChAd3**). This approach uses ChAd vectors to obviate the issue of background immunity to human Ad5 vectors. The adenovirus is used as a carrier, or vector, to deliver benign genetic material derived from the Ebola virus Zaire species that has caused the current Ebola outbreak in West Africa. The genetic material contained in the investigational vaccine cannot cause a vaccinated individual to become infected with Ebola. The vaccine candidate delivers the Ebola genetic material to human cells but does not replicate further. Rather, the Ebola gene that it carries allows the cells of the vaccine recipient to express a single Ebola protein, and that protein prompts an immune response in the individual. The vaccine has shown promising protection in non-human primates (NHP) exposed to Ebola without significant adverse effects.

NIAID support is assisting Crucell (a Netherlands based biotechnology company) and Bavarian Nordic, based in Denmark. Crucell is developing a **multivalent Ebola/Marburg vaccine** using a recombinant adenovirus platform. Phase 1 clinical trial of this candidate vaccine is anticipated to begin by late 2015. The Multivalent **filovirus vaccine is based on recombinant adenovirus (Ad) vectors Ad26 and Ad35** that infect humans at low seroprevalence. Protective efficacy studies to date have all involved an Ad26 prime and an Ad35 boost with various viral GP antigens (EBOV, SUDV, MARV, and TAFV), followed by an exposure of four weeks after the boost immunization.

NIAID and Thomas Jefferson University in Philadelphia have developed an investigational **Ebola vaccine using the established rabies virus vaccine** platform. Ebola virus (EBOV) vaccine platform is based on: (a) replication competent rabies virus (RABV); (b) replication-deficient RABV;or (c) chemically inactivated RABV expressing EBOV glycoprotein (GP). The vaccines were found to be safe and produced potent immune responses against both rabies and Ebola viruses when tested in nonhuman primates. NIAID supported researchers are currently pursuing the development of multivalent vaccine candidates against Ebola, Marburg and rabies viruses for use in humans.

DoD-USAMRIID is working on a **VLP (virus like particles) vaccine for filoviruses**. VLPs are virus-sized particles formed by viral proteins (EBOV and MARV glycoproteins) which retain virus morphology but are noninfectious. VLPs have the advantages of rapid production in large quantities and generate robust innate, humoral and cellular immunity in rodents, NHPs and humans. There are no issues regarding vector immunity. A single vaccine may be effective against EBOV, SUDV, and MARV.

University of Texas at Austin researchers are evaluating the mucosal vaccine against **EBOV GP using an Ad5-based vaccine**. The goal is a vaccine that provides systemic and mucosal immunity with memory, low toxicity, and ease of administration and delivery.

Researchers at the University of Hawaii are exploring **recombinant filovirus antigens (GP1.2, VP24, and VP40) as vaccines**. Advantages of the subunit approach include the ability to precisely select antigen doses and the elimination of translation of protein antigens in the host.

Summary of Human and Animal Testing for Ebola Virus Antibodies

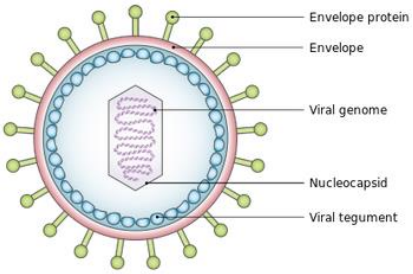
Some non-vaccinated and presumably non-Ebola virus exposed human samples showed the presence of VP40 and GP IgG and IgM but not the NP antibodies. Out of the 3 Ebola virus antibodies, anti-VP40 IgG and IgM appear to be present at higher concentrations and therefore may appear to be more prevalent than GP and NP. Interestingly, other potential mammals (Monkey/primates and pig) have no detectable level or very low levels. Our preliminary but limited data in humans clearly suggests that there is a significant immunity to Ebola virus in non-vaccinated populations, even in areas that are outside the Ebola epidemic, i.e., USA. Clearly, more work needs to be done to determine the source of Ebola virus antibodies and its significance.

Ebola_Marburg_Vaccines_ELISA_Flr 160605A

Human Anti-Epstein Barr Virus Nuclear Antigen 1 (EBNA-1) ELISA Kits

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. 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 EB**NA-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.

About ADI's EBV ELISA Kits - It is necessary to monitor the efficacy of vaccines and determine immune status of population in normal and vaccinated individuals. ADI has developed EBV antibody ELISA Kits for humans and animals that will be useful to determine the efficacy of various existing Diphtheria vaccines and test new vaccines. Antibody ELISA kits for EBV specific antigens are also available.

EBV Vaccine Related ELISA kits ordering Information

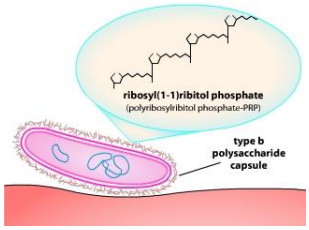
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2791

ELISA Type	Target Antigens	Target Antigens	IgA Cat#	IgG Cat#	IgM Cat#
EBV EBNA-1 ELISA kit, 96 tests	EBNA-1	Human	510-200-HEA	510-205-HEG	510-210-HEM
EBV EA ELISA kit, 96 tests	Early antigen (EA)	Human	510-215-HEA	510-220-HEG	510-225-HEM
EBV VCA ELISA kit, 96 tests	Virus capsid antigen (VCA)	Human	510-230-HEA	510-235-HEG	510-240-HEM
	Early antigen D	Human	510-255-EDA	510-245-EDG	510-250-EDM

EBV Related proteins and antibodies

Catalog#	Product Description	Product Type
RP-347	Recombinant (E.Ccoli, GST tag) Epstein-Barr Virus (EBV/HHV-4) Mosaic EBNA1	Pure protein
RP-348	Recombinant (E.Coli) Epstein-Barr Virus (EBV/HHV-4) Early Antigen	Pure protein
RP-349	Recombinant (E. Coli, GST tag) Epstein-Barr Virus (EBV/HHV-4) p18	Pure protein
RP-350	Recombinant (E.Coli, GST tag) Epstein-Barr Virus (EBV/HHV-4) p23	Pure protein
RP-351	Recombinant (E. coli) Epstein-Barr Virus (EBV/HHV-4) Mosaic p18	Pure protein

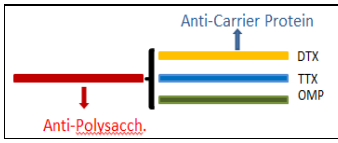
Haemophilus influenzae B (Hib) Vaccine identifications and ELISA Kits



Haemophilus influenzae type B vaccine (**Hib** janan or PRP vaccine is a conjugated vaccine developed for the prevention of invasive disease caused by Haemophilus influenzae type b bacteria. 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.

Several **Hib vaccines** are now available for routine use against Hib that can be used alone or in combination with other vaccines (multivalent). Earlier polysaccharide vaccines contained only **non-conjugated Hib-PRP** and it only produced age-dependent and variable immunity. 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/toxoid/TT)**, mutant **diphtheria protein** (DT/CRM197), and **meningococcal group B outer membrane proteins**. Hib vaccine combined with diphtheria-tetanus-pertussis-polio vaccines and Hepatitis B vaccines are available in the US. 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%. 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.

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 Polysaccharide conjugated to various carrier protein

About ADI's Hib-PRP ELISA Kits - 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 vaccine's **PRP** only. ADI also have separate ELISA kit to measure antibodies to Diphtheria Toxoid, Tetanus Toxoid or HBsAg (the PRP-carrier proteins).

Hib-PRP antigen ELISA is designed to measure the HIB-PRP (Polyribosyl phosphate), an active component of Hib vaccines in free form or in conjugation with carrier proteins such as tetanus toxoid, diphtheria toxoid or OMPC of various Hib vaccines. It is the first commercial ELISA kit based on sandwich ELISA utilizing highly specific PRP antibodies. Hib-PRP antigen ELISA will be useful for vaccine manufacturers and researchers for quality control and lot releases. The kit will also serve the needs of vaccine regulators to identify and establish the concentration of active vaccine components.

Hib Vaccine Related Reagents and ELISA kits

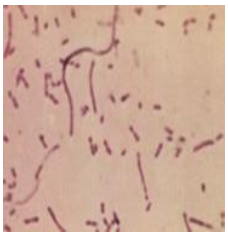
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2725

Items Description	Kit Type	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
Hib Vaccine Anti-Polyribosyl phosphate (Hib-PRP) Antibody ELISA Kit,	Antibody (PRP)	Human	980-100-PHG	980-110-PHM
		Monkey	980-150-PKG	
		Mouse	980-120-PMG	980-130-PHM
		Rabbit	980-130-PRG	980-140-PRM
Hib Vaccine Anti-Diphtheria Toxoid (DT/Dtox) Antibody ELISA Kit,	Antibody (DT)	Human	940-100-DHG	940-110-DHM
		Mouse	940-120-DMG	940-125-DMM
		Rabbit	980-130-PRG	980-140-PRM
Hib Vaccine Anti-Tetanus Toxoid (TT/Ttox) Antibody ELISA Kit,	Antibody (TT)	Human	930-100-TTH	
		Mouse	930-130-TMG	930-130-TTM
		Rabbit	930-210-TRG	930-220-TRM
Hib-PRP antigen ELISA kit for measuring PRP (free antigen) or in vaccines, 96 tests new	Antigen	#980-HIB-AG1 (96 tests)		
ID-Vac™ Hib Vaccines Identification Kit (a rapid test to confirm the identity of commercial vaccines)	Vaccine Identification	980-VID-Hib-48 (48 tests) 980-VID-Hib-96 (96 tests)		
Human Anti-Hib-PRP IgG –ve and +ve controls	Hib-PRP IgG Control sera	980-101-HNC (-ve control, several samples) 980-101-HPC (+ve control, several samples)		

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

Hib_Vaccine_Flr.doc Rev. 160605A

H. influenza Non-Typeable Protein D (NT-PHiD) Vaccines, Antibodies, and ELISA Kits



Haemophilus influenzae is a small, nonmotile Gram-negative coccobacillus which was first described in 1982. It is generally aerobic but can grow as a facultative anaerobe too. *Haemophilus influenzae* was mistakenly considered to be the causative agent of the common flu, until the discovery of the influenza virus in 1933 as the causative agent; however, *Haemophilus influenzae* is still responsible for causing many other diseases. Non-encapsulated organisms from sputum are pleomorphic and often exhibit long threads and filaments. The organism may appear Gram-positive unless the Gram stain procedure is very carefully carried out.

Genetic diversity among unencapsulated strains is greater than within the encapsulated group. Unencapsulated strains are termed **nontypable (NTHi)** because they lack capsular serotypes; however, they can be classified by multilocus sequence typing. Six typeable capsular serotypes (a-f) are known to cause disease; non-typeable encapsulated strains can occasionally cause invasive disease. The most virulent strain is **H. influenzae type b (Hib),** which accounts for more than 95% of H. influenzae infections in children and half of infections in adults.

H. influenzae became the first free-living organism with its entire genome sequenced. Its genome consists of 1740 protein-coding genes. **H. Influenzae protein D (Non-typeable, NT-PHiD)** is an immunoglobulin D-binding membrane protein exposed on the surface of the gram-negative bacterium *Haemophilus influenzae*. Protein D, a surface lipoprotein highly conserved among capsulated and noncapsulated strains of *H. influenzae* has been considered to be a promising **vaccine candidate** against experimental nontypeable *H. influenzae* infection. Effective vaccines against Hib strains have been used widely, but they do not protect children against infections caused by NTHi strains. PD is involved in the pathogenesis of respiratory tract infections and its glycerophosphodiesterase (GlpQ) activity contributes to its virulence factor. Protein D shows 78% amino acid similarity to the periplasmic nonlipidated GlpQ protein in Escherichia coli and 90% amino acid similarity to the lipoprotein homologue in Pasteurella multocida.

Protein D has been shown to be a lipoprotein preceded by an 18-amino-acid signal peptide at the N terminus which ends with the consensus sequence for lipoproteins, Leu-Ala-Gly-Cys. Protein D of *Haemophilus influenzae* (AAA24998.1) is conserved in *H.influenzae* (100%), *H.haemolyticus* (96%), *Pasteurella pneumotropica* (89%), *Aggregatibacter aphrophilus* (91%), *Haemophilus parasuis* (83%), *Pasteurella multocida* (85%), *Actinobacillus suis* (81%), *Mannheimia haemolytica* (83%).

About ADI NT-PHiD ELISA Kits - ADI has pruduced recombiant protein D, made antibodies, and developed antibody ELISA kits. The ELISA kits can be used to assess immune status of humans and animals and to determine or formulated NT-PhiD Vaccines. Antibodies ELISA kits are avauilable for human, mouse, rabbit, and monkey to detect antibodies of IgG/IgM subtypes. Antibody ELISA kits for other species and isotypes not listed here can be made availabel as well.

H. influenza Non-Typeable Protein D (NT-PHiD) ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2942

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#	Antibody Type IgA Cat#
H. Influenzae protein D (Non-typeable, NT-PHiD) IgG ELISA Kit, 96 tests	Human	980-200-PDG	980-200-PDM	
	Mouse	980-220-PDG		
	Rabbit	980-230-PDG		
	Monkey	980-250-PDG		

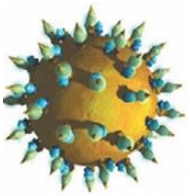
H. influenza Non-Typeable Protein D (NT-PHiD) & Antibodies

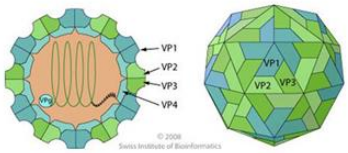
Catalog#	Prod Description	Product Type
PHID11-C	Recombinant H. Influenzae protein D (Non-typeable, NT-PHiD) controls for western blot	WB Control
PHID11-S	Anti-Human H. Influenzae protein D (Non-typeable, NT-PHiD) antiserum	antiserum
PHID15-R-10	Recombinant H. Influenzae protein D (Non-typeable, NT-PHiD) purified PHID protein (>95%, 6x His tag)	protein

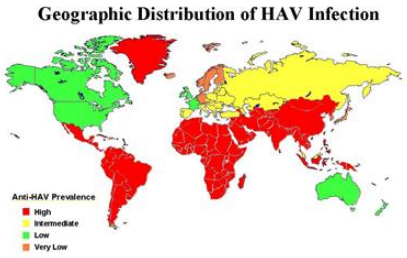
Haemophilus-influenza-PHID-ELISA-Flr 160525A

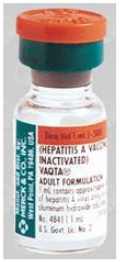
Hepatitis A Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

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 aluminum 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.

About ADI's HAV ELISA Kits - 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. 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	Human	Mouse
Anti-Hepatitis A Virus (**HAV**) ELISA kit, Qualitative, 5x96 tests	IgG	4300-AHG	4310-AMG

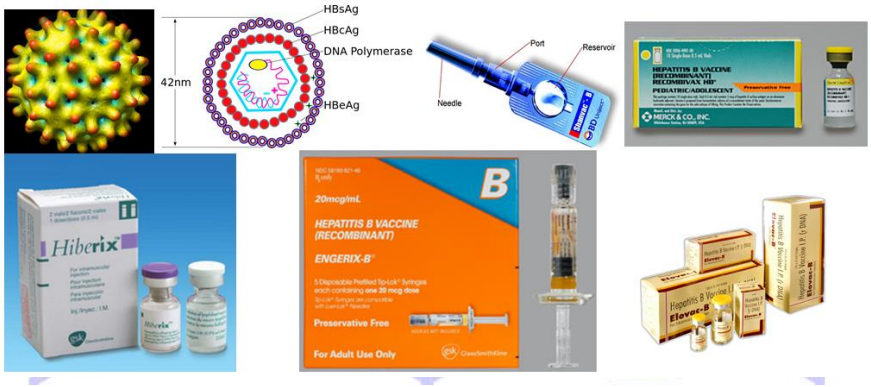
Hepatitis A Recombinant Proteins and Antibodies

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 160605A

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.

About ADI's HBV ELISA Kits - ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines in humans and animals. Unlike most other diagnostic ELISA kits, these kits are quantitative to allow determination of antibody titer to establish better vaccine formulations.

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

(http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2731

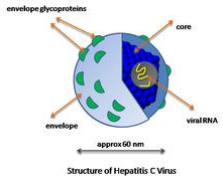
Items Description	Species	IgG Cat#	IgM Cat#	IgA Cat#
Hepatitis B Vaccine (HBsAg **antibody**) ELISA kits	Human	4200	4205	4200-30-IGA
	Human	4220-AHB		
	Human	4230-AHB-R (rapid Test)		
	Mouse	4210	4215	4210-30-IGA
	Rabbit	4240		
	Monkey	4250		
	G. Pig	4260		
HBsAg (antigen) ELISA Kits	#4105, **HBsAg**) ELISA kit for the detection of antigen in human serum			
	#4110, **HBsAg**) ELISA kit for the detection of Recombinant HBsAg (quantitative)			
	VacciGel Direct ELISA for the measurement of Hepatitis B Vaccine (HBsAg) **formulated in Alum,**			

Hepatitis B Vaccine Related Antibodies and Reagentes kits

Catalog#	Product Description	Antibody Type	Product Type
AR-233-U	Hepatitis B Virus (HBV) Polymerase (P protein) (A9), RNA Aptamer, unlabeled		RNA Aptamers
HBA11-A	Anti-Hepatitis Surface Antigen (HBsAg) IgG, aff pure	Goat-Poly	Antibodies
HBA11-C	Recomb. purified HBsAg protein control for WB		WB Control
HBA12-M	Mouse anti-Hepatitis Surface Antigen (HBsAg) (clone 1)	Mouse-Mono	Antibodies
HBA13-M	Mouse anti-Hepatitis Surface Antigen (HBsAg) (clone 2)	Mouse-Mono	Antibodies
HBA15-A	Anti-Hepatitis Surface Antigen (HBsAg) IgG, aff pure	Horse-Poly	Antibodies
HBA16-A	Anti-Hepatitis Surface Antigen (HBsAg) IgG	Rabbit-Poly	Antibodies
HBA26-N-100	HBsAg Ad, Native (human plasma) purified		Purified antigen
HBA27-G-145R	Hepatitis Surface Antigen subtype Adw Mutant G-145-R (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-K-141E	Hepatitis Surface Antigen subtype Adw Mutant K-141-E (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-M-133H	Hepatitis Surface Antigen subtype Adw Mutant M-133-H (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-M-133L	Hepatitis Surface Antigen subtype Adw Mutant M-133-L (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-N-25	Hepatitis Surface Antigen subtype Adw (HBsAg Adw), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-P-142S	Hepatitis Surface Antigen subtype Adw Mutant P-142-S (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-Q-129HL	Hepatitis Surface Antigen subtype Adw Mutant Q-129-H (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-Q-129L	Hepatitis Surface Antigen subtype Adw Mutant Q-129-L (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-T-126N	Hepatitis Surface Antigen subtype Adw Mutant T-126-N (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA27-T-143K	Hepatitis Surface Antigen subtype Adw Mutant T-143K-L (HBsAg Adw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA28-N-100	Hepatitis Surface Antigen subtype Ay (HBsAg Ay), Native (human plasma) purified		Purified antigen
HBA29-G-145R	Hepatitis Surface Antigen subtype Ayw Mutant G-145-R (HBsAg Ayw mutant), Recombinant (P. Pastoris), purified		Purified antigen
HBA29-N-25	Hepatitis Surface Antigen subtype Ayw (HBsAg Ayw), Recombinant (P. Pastoris), purified		Purified antigen
HBA30-N-50	Hepatitis Surface Antigen subtype Adr (HBsAg Adr), Recombinant (S. Cerevisae), purified		Purified antigen
HBA31-N-25	Hepatitis Surface Antigen subtype Adr (HBsAg Adr), Recombinant (CHO), purified		Purified antigen
HBA35-N-500	Hepatitis Surface Antigen (HBsAg), Recombinant (E. coli), purified		Purified antigen
HBA36-N-25	Hepatitis Surface Antigen subtype Ayw (HBsAg Ayw), Recombinant (s. cerevisae), purified		Purified antigen
HBSAG19-R-1	Recombinant (E. coli) purified Hepatitis B surface Antigen (HBsAg, Ad/Ay)		Purified antigen
RP-342	Recombinant (E.Coli) Anti-Hepatitis B Virus Surface Antigen (HBsAg) Ck IgG		Antibodies
RP-445	Recomb. (yeast) Hepatitis B Surface Antigen ayw subtype,		Pure protein
RP-446	Recombinant (E.Coli) Hepatitis B Surface Antigen preS1		Pure protein
RP-447	Recombinant (yeast) Hepatitis B Surface Antigen Adw subtype		Pure protein
RP-448	Recombinant (yeast) Hepatitis B Surface Antigen adr subtype, Saccharomyces		Pure protein
RP-449	Recombinant Hepatitis B Surface Antigen preS2		Pure protein
RP-450	Recombinant (CHO cells) Hepatitis B Surface Antigen adr subtype, CHO		Pure protein
SP-102028-1	Hepatitis B Virus Receptor Binding Fragment (AA: Pro-Leu-Gly-Phe-Phe-Pro-Asp-His-Gln-Leu-Asp-Pro-Ala-Phe-Gly-Ala-Asn-Ser-Asn-Asn-Pro-Asp-Trp-Asp-Phe-Asn-Pro) (MW: 3030.2)		Pure Peptide

Hepatitis C Vaccines (HCV) Antibody ELISA Kits, Recomb. Proteins, Peptides and Antibodies

HCV is a small (55–65 nm), enveloped, positive-sense ssRNA virus of the family Flaviviridae. Hepatitis C virus is the cause of hepatitis C and some cancers such as Liver Cancer (Hepatocellular carcinoma abbreviated HCC) and lymphomas in humans. 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. 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. 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.



Structure of Hepatitis C Virus

No vaccine against hepatitis C is available. Most vaccines work through inducing an antibody response against the HCV E2. However, the Hepatitis C virus is highly variable among strains and fast mutated, making an effective vaccine very difficult.

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

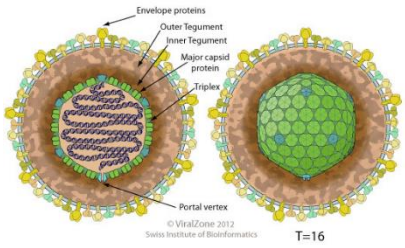
Hepatitis C vaccine Related Antibodies and Reagentes kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2732

Cat#	Product Description	Product Type
AB-15610	Mouse Anti-HCV NS3 IgG	Antibodies
HCV16-R	Recomb. (P. pastoris) HCV core protein (N-term 120 aa, ~16 Kda) (insoluble)	Recomb. Protein
HCV21-R	Recomb. (E. coli, his-tag) HCV core protein Mosaic regions) (soluble)	Recomb. Protein
HCV23-R	Recomb. (E. coli) Hepatitis C Virus (HCV Antigen mosaic (Core1b, Core 3g, NS3, NS41, NS411, & NC5) (insoluble)	Recomb. Protein
HCV36-R	Recombiant (E. coli) HCV Antigens-GST fusion protein (mosaic) (soluble)	Recomb. Protein
HNS35-R	Recomb. (E. coli) HCV NS3 protein	Recomb. Protein
HNS37-R	Recomb. (E. coli) HCV NS3 1a helicase protein (c33c) immunodominant regions	Recomb. Protein
HNS45-R	Recomb. (E. coli) HCV NS4 protein, fragments of the NS4 immunodominant regions 11 HCV genotypes, (soluble)	Recomb. Protein
HNS55-R	Recomb. (E. coli) HCV NS5 protein, fragments of the NS5 immunodominant	Recomb. Protein
RP-457	Recomb. (E.Coli) HCV NS4 a+b, **Biotin**	Pure protein
RP-458	Recomb. (E.Coli) HCV Nucleocapsid (core) Genotype-3/10	Pure protein
RP-459	Recomb. (E.Coli) HCV NS4	Pure protein
RP-460	Recomb. (E.Coli, his tag) HCV Nucleocapsid (core) Genotype-1a	Pure protein
RP-461	Recomb. (E.Coli, his tag) HCV NS3 Genotype-1b	Pure protein
RP-462	Recomb. (E.Coli, his tag) HCV NS4 Mosaic	Pure protein
RP-463	Recomb. (E.Coli) HCV NS5 Genotype-1a (2322-2423)	Pure protein
RP-464	Recomb. (E.Coli) HCV Combined	Pure protein
RP-465	Recomb. (E.Coli, his tag) HCV NS3 Genotype-1c	Pure protein
RP-466	Recomb. (E.Coli, his tag) HCV NS3 Genotype-2c (1192-1459)	Pure protein
RP-467	Recomb. (E.Coli, his tag) HCV NS3 Genotype-2b (1192-1459)	Pure protein
RP-468	Recomb. (E.Coli, his tag) HCV NS3 Genotype-6a (1192-1459)	Pure protein
RP-469	Recomb. (E.Coli) HCV NS3 Genotype-5a	Pure protein
RP-470	Recomb. (E.Coli, his tag) HCV Nucleocapsid (core) Genotype-1	Pure protein
RP-471	Recomb. (E.Coli) HCV Nucleocapsid (core) Genotype-2a	Pure protein
RP-472	Recomb. (E.Coli) HCV Nucleocapsid (core) Genotype-3a	Pure protein
RP-473	Recomb. (E.Coli) HCV Nucleocapsid (core) Genotype-4	Pure protein
RP-474	Recomb. (E.Coli) HCV Nucleocapsid (core) Genotype-5	Pure protein
RP-475	Recomb. (E.Coli, his tag) HCV Nucleocapsid (core) Genotype-6a	Pure protein
RP-476	Recomb. (E.Coli) HCV NS5 Genotype-1	Pure protein
RP-478	Recomb. (E.Coli) HCV NS4, HRP Conj	Pure protein
RP-479	Recomb. (E.Coli) HCV NS5 Genotype-3	Pure protein
RP-480	Recomb. (E.Coli, GST tag) HCV NS5 Genotype-4	Pure protein
RP-481	Recomb. (E.Coli) HCV NS5 Genotype-5	Pure protein
RP-482	Recomb. (E.Coli) HCV NS5 Genotype-6	Pure protein
RP-483	Recomb. (E.Coli) HCV Nucleocapsid (core) 22kDa, Biotin	Pure protein
RP-484	Recomb. (E.Coli) HCV NS4 a+b, Rhodamine Labeled	Pure protein
RP-485	Recomb. (E.Coli, his tag) HCV NS5 Genotype-1a	Pure protein
RP-486	Recomb. (E.Coli, GST tag) HCV NS5 Genotype-1b	Pure protein
RP-487	Recomb. (E.Coli) HCV NS5 Genotype-2	Pure protein
RP-488	Recomb. (E.Coli) HCV NS5 Genotype-2a	Pure protein
RP-489	Recomb. (E.Coli, GST tag) HCV NS5 Genotype-2b	Pure protein
RP-490	Recomb. (E.Coli, GST tag) HCV NS5 Genotype-3a	Pure protein
RP-491	Recomb. (E.Coli, GST tag) HCV NS5 Genotype-3b	Pure protein
RP-492	Recomb. (E.Coli, GST tag) HCV NS5 Genotype-6a	Pure protein
RP-493	Recomb. (E.Coli, GST tag) Hepatitis C Virus(HCV) NS5	Pure protein
RP-494	Recomb. (E.Coli, histag) HCV NS5, Biotin	Pure protein
RP-495	Recomb. (E.Coli, GST tag) HCV Nucleocapsid (core) Genotype-2b	Pure protein
RP-496	Recomb. (E.Coli, GST tag) HCV Nucleocapsid (core) Genotype-3b	Pure protein
RP-498	Recomb. (E.Coli) HCV Nucleocapsid (core) 24	Pure protein
RP-499	Recomb. (E.Coli) HCV Nucleocapsid (core) 22kDa	Pure protein
RP-501	Recomb. HCV Nucleocapsid (core), **HRP**	Pure protein
RP-502	Recomb. (E.Coli) HCV NS3 (1450-1643), Biotin Labeled	Pure protein
RP-503	Recomb. (E.Coli) HCV Nucleocapsid (core) Genotype-1b	Pure protein
RP-504	Recomb. (E.Coli) HCV NS3 Genotype-1a (1192-1459)	Pure protein
RP-505	Recomb. (E.Coli) HCV NS3 Genotype-1b (1192-1459)	Pure protein
RP-506	Recomb. (E.Coli) HCV NS3 Genotype-1a (1356-1459)	Pure protein
RP-507	Recomb. (E.Coli) HCV NS3 Genotype-1b (1356-1459)	Pure protein
RP-508	Recomb. HCV NS3 Genotype-2b (1356-1459)	Pure protein
RP-509	Recomb. (E.Coli, his tag) HCV NS3 Genotype-3 (1356-1459)	Pure protein
RP-510	Recomb. (E.Coli) HCV NS3 Genotype-4 (1356-1459)	Pure protein
RP-511	Recomb. (E.Coli, his tag) HCV NS3 Genotype-5 (1356-1459)	Pure protein
RP-512	Recomb. (E.Coli, GST tag) HCV NS3 Genotype-6 (1356-1459)	Pure protein

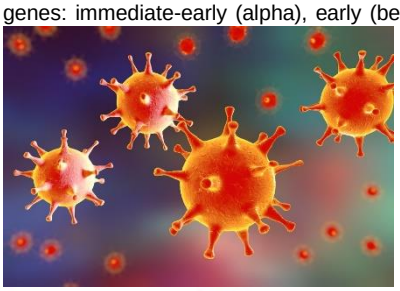
Herpes Simplex Virus (HSV-1/2) Vaccines ELISA, Recombinant Proteins, and Antibodies

Herpes has been known for at least 2,000 years. Herpes simplex (creeping or latent") is a viral disease caused by the herpes simplex virus (HSV). Infections are categorized based on the part of the body infected. **Oral herpes** involves the face or mouth. It may result in small **blisters** in groups often called **cold sores** or fever blisters or may just cause a sore throat. **Genital herpes**, often simply known as herpes, may have minimal symptoms or form blisters that break open and result in small ulcers. Other disorders caused by herpes simplex include: **herpetic whitlow** when it involves the **fingers, herpes of the eye, herpes infection of the brain,** and **neonatal herpes** when it affects a newborn, among others.



There are two types of herpes simplex virus, type 1 (HSV-1) and type 2 (HSV-2). HSV-1 more commonly causes **oral infections** while HSV-2 more commonly causes **genital infections**. Oral and genital herpes is usually diagnosed based on the presenting symptoms. The diagnosis may be confirmed by viral culture or detecting herpes DNA in fluid from blisters. Testing the blood for antibodies against the virus can confirm a previous infection but will be negative in new infections. Worldwide rates of either HSV-1 or HSV-2 are between 60% and 95% in adults. HSV-1 is usually acquired during childhood. An estimated **536 million** people worldwide (16% of the population) were infected with HSV-2 as of 2003 with greater rates among women and those in the developing world. In most cases, HSV is never removed from the body by the immune system. Following a primary infection, the virus enters the nerves at the site of primary infection, migrates to the cell body of the neuron, and becomes latent in the ganglion. As a result of primary infection, the body produces antibodies to the particular type of HSV involved, preventing a subsequent infection of that type at a different site. In HSV-1-infected individuals, seroconversion after an oral infection prevents additional HSV-1 infections such as whitlow, genital herpes, and herpes of the eye. No method eradicates herpes virus from the body, but antiviral medications can reduce the frequency, duration, and severity of outbreaks.

HSV contains a large dsDNA (~150 kb) encased within an icosahedral protein cage called the **capsid**, which is wrapped in a lipid bilayer called the **envelope**. The envelope is joined to the capsid by means of a **tegument**. This complete particle is known as the **virion**. HSV-1 and HSV-2 each contain at least 74 genes. These genes encode a variety of proteins involved in forming the capsid, tegument and envelope of the virus, as well as controlling the replication and infectivity of the virus. HSV genome contain two unique regions called the long unique region (**UL**) and the short unique region (**US**). Of the 74 known ORFs, UL contains 56 viral genes, whereas US contains only 12. The herpes simplex 1 genomes can be classified into six clades. Four of these occur in East Africa, one in East Asia and one in Europe and North America. There are three temporal classes of genes: immediate-early (alpha), early (beta) and late (gamma). The



immediate-early genes are transcribed immediately after infection to take control of cell defense and to activate early genes. These encode the proteins necessary for the viral DNA replication. The **late genes** mostly encode structural proteins. Latent genes can stop the replicative process at the early step. Attachment of the viral **gB, gC, gD and gH** proteins to host receptors mediates endocytosis of the virus into the host cell.

HSV-2 Vaccines: Many vaccines based upon recombinant viral capsid protein **gD-2** have failed. **GEN-003** vaccine (Genocea) is a protein subunit T cell-enabled therapeutic vaccine, or immunotherapy, designed to reduce the duration and severity of clinical symptoms associated with moderate-to-severe genital herpes, and to control transmission of the infection. A recent report suggests that a recombinant and weakened HSV-2 virus devoid of gD-2 protein proven effective in animals. It appears that deletion of gD-2 enhances production antibodies to other viral proteins.

About ADI's HSV ELISA Kits - ADI has developed **HSV-1 and 2 antibody ELISA kits** to determine the efficacy of vaccines and test new vaccines. These ELISA detects antibodies to several HSV-1 or -2 proteins but antigen specific (gD-2) HSV-1/2 ELISA can be developed on a custom basis.

HSV Vaccine Related ELISA

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2945

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#	Antibody Type IgA Cat#
HSV-1 viral proteins antibody ELISA	Human	3300-380-H1G	3300-385-H1M	
HSV-2 viral proteins antibody ELISA	Human	3300-390-H2G	3300-395-H2M	
HSV1+2 antibody ELISA	Human	3300-400-12G	3300-405-12M	
Note: Mouse, and monkey HSV-1/2 antibody ELISA available on a custom basis.				

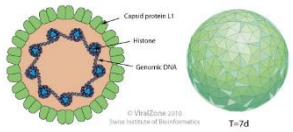
HSV-1/2 Recombinant Proteins, Peptides and Antibodies

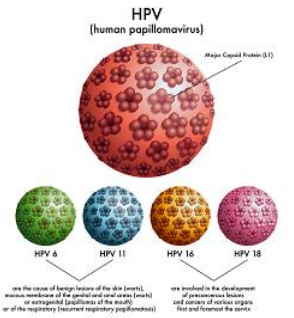
Catalog#	Product Description	Product Type
RP-632	Recombinant (E.Coli) Herpes Simplex Virus-1 gD (HSV-1 gD)	Pure protein
RP-633	Recombinant (E.Coli) Herpes Simplex Virus-1 gD	Pure protein
RP-634	Recombinant (E.Coli) Herpes Simplex Virus-2 gD (HSV-2 gD)	Pure protein
RP-635	Recombinant (E.Coli) Herpes Simplex Virus-2 gG (HSV-1 gG)	Pure protein
RP-636	Recombinant (E.Coli) Herpes Simplex Virus-1 gG	Pure protein
RP-637	Recombinant (E.Coli) Herpes Simplex Virus-8 Mosaic	Pure protein
SP-102029-5	Herpes Virus Inhibitor 1 (AA: Tyr-Ala-Gly-Ala-Val-Val-Asn-Asp-Leu) (MW: 920.46)	Pure Peptide

Herpes-Simplex-Virus-HSV-Vaccine-Flr.docx 160604A

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.





HPV is a non-enveloped, small, icosahedral, about 60 nm in size. A single molecule of circular dsDNA is contained within the T=7 icosahedral capsid, which is composed of 72 pentamers. The HPV genome (dsDNA of ~8kb) 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 translated and serve as structural proteins that encapsulate 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 (501-aa), HPV11 L1 (503-aa) HPV16 L1 (531aa/505-aa), HPV18 L1 (568-aa/427-aa). HPVL1s from HPV6, 11, 18, and 18 subtypes share ~50% sequence homology.

HPV Vaccines: The first HPV vaccine became available in 2006. 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. The vaccination is expected to protect against penile cancer and anal cancer caused by included HPV types, and research in this area is ongoing. **Gardasil 9** has 5 additional HPVL1s (**HPV-31, HPV-33, HPV-45, HPV-52, and HPV-58**), it was approved in 2014. The protective effects of the vaccine are expected to last a minimum of 4.5 years after the initial vaccination.

About ADI's HPV ELISA Kits- ADI has cloned, expressed, and purified **L1s from HPV6, HPV11, HPV16, and HPV18**, **HPV31, HCP33, HPV45, HPV45, and HPV52** viruses. It is necessary to monitor the efficacy of vaccines and determine immune status of population in normal and vaccinated individuals. ADI has developed HPV antibody ELISA Kits for humans and animals that will be useful to determine the efficacy of various HPV vaccines. ADI is making available antibody ELISA kits for individual HPV serotypes used in Gardasil 5, Gardasil 9, and Cervarix as well as combo ELISAs that measure antibody response to the mix of serotypes used in HPV vaccines. Recombinant HPV proteins and antibodies are also available to further research into HPV vaccines.

Human papilloma virus vaccine Related ELISA kits

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

Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Rabbit
Human Papilloma Virus (HPV)	HPV6L1	Ab	IgG	550-106-PHG	550-306-PMG	550-206-PRG
	HPV11L1		IgG	550-111-PHG	550-311-PMG	550-211-PRG
	HPV16L1		IgG	550-116-PHG	550-316-PMG	550-216-PRG
	HPV18L1		IgG	550-118-PHG	550-318-PMG	550-218-PRG
	HPV31L1	Ab	IgG	550-131-PHG	550-331-PMG	550-231-PRG
	HPV33L1	Ab	IgG	550-133-PHG	550-333-PMG	550-233-PRG
	HPV45L1	Ab	IgG	550-145-PHG	550-345-PMG	550-245-PRG
	HPV52L1	Ab	IgG	550-152-PHG	550-352-PMG	550-252-PRG
	HPV58L1	Ab	IgG	550-158-PHG	550-358-PMG	550-258-PRG
	HPV 6+11+16+18 (**Gardasil**)	Ab	IgG	550-100-PHG	550-300-PMG	550-200-PRG
	HPV 16+18 (**Cervarix**)	Ab	IgG	550-400-PHG	550-420-PMG	550-410-PRG
	HPV 6+11+16+18+31+33+45 +52+58 (**Gardasil 9**)	Ab	IgG	550-500-PHG	550-520-PMG	550-510-PRG

Human Papilloma Virus (HPV) 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-HPV6 early protein 7 (E7) (HPV6E7) IgG,	Antibodies
	HPV06L11-M	Monoclonal Anti-HPV6 late protein L1 (HPV6L1) IgG	Antibodies
	HPV06L12-S	Rabbit Anti-HPV6 late protein L1 (HPV6L1, full length) antiserum	Antibodies
	HPV06L15-R-10	Recombinant (E.coli) HPV06 late protein L1 (HPV6L1), full length, His-tag	Recomb protein
HPV11	HPV11L11-M	Monoclonal Anti-HPV11 (HPV11) late protein L1 (HPV11L1) IgG, aff pure #1	Antibodies
	HPV11L12-S	Rabbit Anti-HPV11 late protein L1 (HPV11L1, full length) antiserum	Antibodies
	HPV11L15-R-10	Recomb. (E. coli) HPV11 late protein L1 (HPV11L1), full length, His-tag	Recomb protein
HPV16	HPV16E21-M	Monoclonal Anti-HPV16 early protein E2 (HPV16E2) IgG, aff pure #1	Antibodies
	HPV16E61-M	Monoclonal Anti-HPV16 (HPV16) early protein E6 (HPV16E6) IgG, aff pure #1	Antibodies
	HPV16E71-M	Monoclonal Anti-HPV16 (HPV16) early protein E7 (HPV16E7) IgG, aff pure #1	Antibodies
	HPV16L12-S	Rabbit Anti-HPV16 late protein L1 (HPV16L1, full length) antiserum	Antibodies
	HPV16L11-M	Monoclonal Anti-HPV16 (HPV16) late protein L1 (HPV16L1) IgG, aff pure #1	Antibodies
	HPV16L11-C	Recomb. purified HPV16 late protein L1 ((HPV16l1, full length) control for WB	Western Control
	HPV16E21-R-100	Recomb. (E.coli) HPV16 early protein (HPV16, E2+E6+E7 epitopes fused to GST	Recomb protein
	HPV16L15-R-10	Recomb. (E.coli) HPV16 late protein L1 protein ((HPV16L1, his-tag), full length	Recomb protein
HPV18	HPV18E61-M	Monoclonal Anti-HPV18 early protein E6 (HPV18E6) IgG, aff pure #1	Antibodies
	HPV18E71-M	Monoclonal Anti-HPV18 early protein E7 (HPV18E7) IgG, aff pure #1	Antibodies
	HPV18L12-S	Rabbit Anti-HPV18 late protein L1 (HPV18L1, full length) antiserum	Antibodies
	HPV18L11-M	Monoclonal Anti-HPV18 late protein L1 (HPV18L1) IgG, aff pure #1	Antibodies
	HPV618L13-S	Mouse Anti-Gardasil vaccine L1s (HPV6+11+16+18 late proteins) antiserum	Antibodies
	HPV18L11-C	Recomb. purified HPV18 late protein L1 (HPV18L1, full length) control for WB	WB Blot +ve Control
	HPV18E25-R-50	Recomb. HPV18 early protein (HPV18; E2+E6+E7 epitopes fused to GST protein	Recomb protein
	HPV18L15-R-10	Recomb. (E.coli) HPV18 late protein L1 (HPV18L1), full length, His-tag	Recomb protein
	SP-100307-1	HPV-E7-N (MW: 2467.72)	Synthetic peptide
	SP-100308-1	HPV-E7 (MW: 2102.08)	Synthetic peptide
	SP-100309-1	HPV-E6-N (MW: 1810.07)	Synthetic peptide
	SP-100310-1	HPV-E6-M (MW: 2459.64)	Synthetic peptide
	SP-100311-1	HPV-E6-C (MW: 2516.92)	Synthetic peptide
HPV31	HPV31L11-S	Rabbit-Anti-HPV31 L1 protein antiserum	Antibodies
	HPV31L11-C	Recomb. HPV31 L1 protein (>95% full length, His-tag) for WB +ve control	Western Control
	HPV31L15-R-10	Recomb. (E. coli) HPV31 L1 protein (>95% full length, His-tag) for ELISA	Recomb. protein
HPV33	HPV33L11-S	Rabbit-Anti-HPV33 L1 protein antiserum	Antibodies
	HPV33L11-C	Recomb. HPV33 L1 protein (>95% full length, His-tag) for WB +ve control	Western Control
	HPV33L15-R-10	Recomb. (E. coli) HPV33 L1 protein (>95% full length, His-tag) for ELISA	Recomb. protein
HPV45	HPV45L11-S	Rabbit-Anti-HPV45 L1 protein antiserum	Antibodies
	HPV45L11-C	Recomb. HPV45 L1 protein (>95% full length, His-tag) for WB +ve control	Western Control
	HPV45L15-R-10	Recomb. (E. coli) HPV45 L1 protein (>95% full length, His-tag) for ELISA	Recomb. protein
HPV52	HPV52L11-S	Rabbit-Anti-HPV52 L1 protein antiserum	Antibodies
	HPV52L11-C	Recomb. HPV52 L1 protein (>95% full length, His-tag) for WB +ve control	Western Control
	HPV52L15-R-10	Recomb. (E. coli) HPV52 L1 protein (>95% full length, His-tag) for ELISA	Recomb. protein
HPV58	HPV58L11-S	Rabbit-Anti-HPV58 L1 protein antiserum	Antibodies
	HPV58L11-C	Recomb. HPV58 L1 protein (>95% full length, His-tag) for WB +ve control	Western Control
	HPV58L15-R-10	Recomb. (E. coli) HPV58 L1 protein (>95% full length, His-tag) for ELISA	Recomb. Protein
HPV antibody -ve and +ve sera	550-006-HPC	Human Anti-HPV6L1 IgG high positive control serum control (5X)	Antibody Controls
	550-006-NPC	Human Anti-HPV6L1 IgG negative/very low positive control serum control (5X)	Antibody Controls
	550-011-HPC	Human Anti-HPV6L11 IgG high positive control serum control (5X)	Antibody Controls
	550-011-NPC	Human Anti-HPV6L11 IgG negative/very low positive control serum control (5X)	Antibody Controls
	550-016-HPC	Human Anti- HPV6L16L1 IgG high positive control serum control (5X)	Antibody Controls
	550-016-NPC	Human Anti-HPV6L16L1 IgG negative/very low positive control serum control (5X)	Antibody Controls
	550-018-HPC	Human Anti-HPV6L18L1 IgG high positive control serum control (5X)	Antibody Controls
	550-018-NPC	Human Anti-HPV6L18L1 IgG negative/very low positive control serum control (5X)	Antibody Controls
	550-006-HPC	Human Anti-HPV6L1 IgG high positive control serum control (5X)	HPV_Vaccine_Flr.pdf

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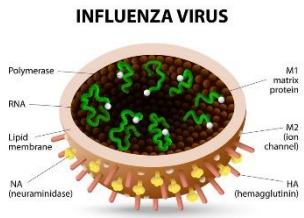
Influenza A & B Vaccines: Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies



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 virus 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**). 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. Influenza viruses have a relatively high mutation rate that is characteristic of RNA viruses. The influenza vaccination, also known as a **flu shot**, is an **annual vacci**nation using a vaccine specific for a given year.

Influenza A Vaccines-

WHO 2015-2016 influenza season (Trivalent Vaccinesr)
– an A/California/7/2009 (H1N1)pdm09-like virus;
– an A/Switzerland/9715293/2013 (H3N2)-like virus;
– a B/Phuket/3073/2013-like virus.

Quadrivalent vaccines containing **two influenza B viruses** contain the above three viruses and a **B/Brisbane/60/2008-like virus**.

Fluzone is a split-virus vaccine that is produced by chemical disruption of the influenza virus. Fluzone is recommended for 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 Quadrivalent (4 influenza virus strains: A/Christchurch/16/2010 NIB-74XP (H1N1) (an A/California/7/2009-like virus), A/Switzerland/9715293/2013 NIB-88 (H3N2) B/Phuket/3073/2013, and B/Brisbane/60/2008; all viruses are grown in chicken eggs). **FLUVIRIN**® is a trivalent, sub-unit (purified surface antigen) influenza virus vaccine prepared from virus propagated in chicken eggs. A/Christchurch/16/2010, NIB-74 (H1N1) (an A/California/7/2009 pdm09-like virus); A/Switzerland/9715293/2013, NIB-88 (H3N2) (an A/Switzerland/9715293/2013-likevirus); and B/Phuket/3073/2013 - wild type (a B/Phuket/3073/2013-like virus). **FLULAVAL**, Influenza Vaccine is a trivalent, split-virion, inactivated influenza virus vaccine produced in chicken eggs (A/California/7/2009 NYMC X-179A (H1N1), A/Switzerland/9715293/2013 NIB-88 (H3N2), and B/Phuket/3073/2013. **AFLURIA**, Influenza Vaccine is also propagated in chicken eggs (A/California/7/2009 (H1N1), NYMC X-181, A/South Australia/55/2014 (H3N2), 448 IVR-175, (an A/Switzerland/9715293/2013-like strain) and B/Phuket/3073/2013).

Influenza B: The only species in this genus is called Influenza B virus infecting only humans and seals. Influenza virus B mutates at a rate 2 to 3 times slower than type A. However, influenza B mutates enough that lasting immunity is not possible.

About ADI Influenza A ELISA Kits-ADI has pruduced recombiant proteins (HA, NP, NS1) made antibodies, and developed antibody ELISA kits usign the recombinant proteis or whole viral antigens (inactivated). The ELISA kits can be used to assess immune status of humans and animals and to determine or formulate new vaccines. Antibodies ELISA kits are avauilable for human, mouse, rabbit, and monkey to detect antibodies of IgG/IgM subtypes. Antibody ELISA kits for other species and isotypes not listed here can be made available as well.

Influenza A Vaccine Related ELISA kits

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

Items Description	Antigens	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#	Antibody Type IgA Cat#
Influenza **A** Virus antibody ELISA kits, 96 tests	HA (H3N2)	Swine/Pig	920-010-PAG	920-020-PAM	920-030-PAA
	Whole virus (H1N1)	Human	920-040-HAG	920-050-HAM	920-060-HAA
	Rabbit (H1N1)	Rabbit	920-070-H1G		
	HA (H5N1)	Human	920-080-H5G	920-085-H5M	
	Whole avian virus	Chicken (avian)	920-100-AIV	920-105-AIM	
	HA (H5N1)	Chicken	920-300-H51		
Influenza **A** Virus Nucleoprotein (NP) IgG ELISA kit	NP (H1/N1)	Human	920-360-HNG	920-365-HNM	
Influenza **B** Virus antibody ELISA kits	Viral proteins	Human	920-400-HBG	920-405-HBM	920-410-HBA
		Mouse	920-500-MBG		
		Rabbit	920-605-RBG	920-610-RBM	

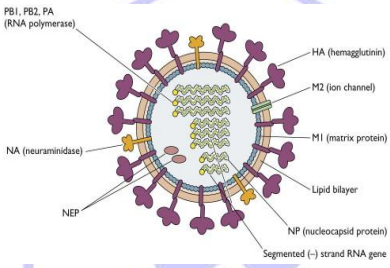
Catalog#	Product Description	Product Type
AB-23091-A	Rabbit Anti-Influenza A virus HA IgG	Antibodies
AB-23091-P	Influenza A virus HA Control peptide	peptides
AR-242-U	Human Influenza A virus H3N2 (P30-10-16), RNA Aptamer, unlabeled	RNA Aptamers
H11N2-01-A	Anti-Hemagglutinin HA1 Influenza A Virus (H11N2; A/duck/Yangzhou/906/2002) IgG	Pure protein
H11N2-01-C	Recomb. Hemagglutinin Influenza A Virus (H11N2; A/duck/Yangzhou/906/2002) protein control for Western	Pure protein
H1N1-01-A	Anti-Hemagglutinin Influenza A Virus H1N1 H1 (H1N1) (A/New Caledonia/20/99) IgG	Pure protein
H1N1-01-C	Recomb. Purified HA Influenza A Virus H1N1 H1 (H1N1) (A/New Caledonia/20/99) protein control for Western	Pure protein
H1N1-01-R-10	Recomb. (HEK) Purified Hemagglutinin Influenza A Virus H1N1 H1 (H1N1) (A/New Caledonia/20/99) protein (>95%, his-tag)	Pure protein
H1N1-02-A	Anti-Hemagglutinin Influenza A Virus H1N1 H1 (Pan H1N1 reacts with multiple strains of H1N1) IgG, purified	Pure protein
H1N12-R-10	Recomb. Purified Hemagglutinin HA1 (A/California/06-2009, H1N1) protein	Pure protein
H1N13-M	Human monoclonal anti-Influenza A hemeagglutinin (HA) IgG (IgG1, Recomb. HEK cells, >95%) (Pan antibody, neutralizing for H1, H2, H5, H6, H8, H9 etc)	Antibodies
H1N1NA11-C	Purified Influenza A Neuraminidase (H1N1-NA) protein control for western blot	Western control
H1N1NA11-S	Rabbit Anti Influenza A Neuraminidase (H1N1-NA) antiserum	Antibodies
H1N1NA15-R-10	Recomb. (E.coli, his tag) Influenza A Neuraminidase (H1N1-NA) protein (>95%)	Rec. Protein
H1NP21-A	Anti-Influenza A H1N1-NP/1-320aa) protein (A/06/California/2009) IgG, aff pure	Antibodies
H1NP25-R-25	Recomb. (HEK) Influenza A n(H1N1-NP/1-320aa) protein (A/06/California/2009, >95%, His-tag)	Rec. Protein
H1NP26-R-25	Recomb. (HEK) purified Influenza A nucleoprotein (H1N1-NP/1-486aa) protein (A/Brisbane/59/2007, >95%, His-tag)	Rec. Protein
H1NP27-R-25	Recomb. (HEK) purified Influenza A nucleoprotein (H1N1-NP/1-498aa) protein (A/Puerto Rico/8/1934, >95%, His-tag)	Rec. Protein
H5N11-C	Recomb. Purified Hemagglutinin Influenza A Virus H5N1 H5 (H5N1) (A/chicken/India/NIV33487/2006) (17-531aa) protein control for Western	Pure protein
H5N11-S	Anti-Hemagglutinin Influenza A Virus H5N1 H5 (H5N1) (A/chicken/India/NIV33487/2006) (17-531aa) protein antiserum	Antbodies
H5N13-S	Anti-Hemagglutinin Influenza A Virus H5N1 H5 (H5N1) (A/chicken/India/NIV33487/2006) (17-531aa) protein antiserum	Antbodies
H5N15-R-10	Recomb. Purified Hemagglutinin Influenza A Virus H5N1 H5 (H5N1) (A/chicken/India/NIV33487/2006) (17-531aa), His-tag	Pure protein
H5N15-R-100	Recomb. HA Influenza A Virus H5N1 H5 (H5N1) (A/chicken/India/NIV33487/2006) (17-531aa), His-tag	Pure protein
HA11-M	Anti-Influenza A hemeagglutinin A1 (HA1/head domain/18-344aa) protein (A/Beijing/262/95)(H1N1) IgG, aff pure	Antibodies
HA15-R-25	Recomb. (HEK) Influenza A hemeagglutinin A1 (HA1/head domain/18-345aa) protein (A/PR/8/34/(H1N1, >95%, His-tag)	Rec. Protein
HA16-R-25	Recomb. (HEK) purified Influenza A hemeagglutinin A1 (HA1/head domain/18-345aa) protein (A/New Caledonia/20/99(H1N1), >95%, His-tag)	Rec. Protein
HA1H011-25	Recomb. (HEK) purified Influenza A HA1 (H1N1) protein (Christchurch/16/2010)(H1N1)] 18-344aa, >95%, his-tag)	Rec. Protein
HA1H012-25	Recomb. (HEK) Influenza A HA1 (H1N1) protein (A/New Caledonia/20/99] 18-345aa, >95%, his-tag)	Rec. Protein
HA1H013-M	Anti-Influenza A HA1 (H1N1) (A/Beijing/262/95), 18-344aa) protein IgG	Rec. Protein
HA1H031-25	Recomb. (HEK) Influenza A HA1 (H3N2) protein (A/Beijing/32/92, 17-345aa, >95%, his-tag)	Rec. Protein
HA1H051-25	Recomb. (HEK) Influenza A HA1 (H5N1) protein (A/Cambodia/R0405050/2007) 24-341aa, >95%, his-tag)	Rec. Protein
HA1H071-25	Recomb. (HEK) Influenza A HA1 (H7N9) protein (A/Shanghai/2/2013(H7N9) 19-338aa, >95%, his-tag)	Rec. Protein

Catalog#	Product Description	Product Type
HA1H091-25	Recomb. (HEK) HA1 (H9N2) protein (A/Hong Kong/1073/99) 19-339aa, >95%, his-tag)	Rec. Protein
HA1H091-25	Recomb. (HEK) HA1 (H9N2) protein (Guinea fowl/Hong Kong/WF10/99, 19-338aa, >95%, his-tag)	Rec. Protein
HA1H111-25	Recomb. (HEK) Influenza A HA1 (H11N2) protein (A/duck/Yangzhou/906/2002) 17-342aa, >95%, his-tag)	Rec. Protein
HA28-A	Anti-Influenza A HA2/stem or stalk domain/347-523aa) protein (A/Viet Nam/1203/2004(H5N1) IgG, aff pure	Rec. Protein
HA28-R-25	Recomb. (HEK) Influenza A HA2/stem or stalk domain/366-531aa) protein (/Vietnam/1203/2004)(H5N1, >95%, His-tag)	Rec. Protein
HA2H011-25	Recomb. (HEK) purified Influenza A HA2 (H5N1) protein (A/Vietnam/1203/2004 366-531aa, >95%, his-tag)	Rec. Protein
HA2H012-A	Anti-Influenza A HA2 (H5N1) (A/Vietnam/1203/2004 366-531aa, >95%, his-tag) protein IgG	Rec. Protein
INFA11-M	Mouse Anti-Influenza A Virus IgG, aff pure	Antibodies
MA-20170	Mouse Monoclonal Anti-Human Influenza A virus Nucleoprotein	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-1625	Recomb. (HEK) HA Influenza A Virus H3N8 (A/equine/Gansu/7/2008) HA protein (1-344, His tag, >95%)	Pure protein
RP-638	Recomb. HA Influenza A Virus H1N1 New Caledonia 20/99 (HA protein full length, Sf9 cells)	Pure protein
RP-640	Recomb. HA Influenza A Virus H7N7 Netherlands 219/03	Pure protein
RP-641	Recomb. HA Influenza A Virus H5N1 Vietnam 1203/04	Pure protein
RP-642	Recomb. Hemagglutinin Influenza A Virus H3N2 New York 55/04 (HA protein full length, Sf9)	Pure protein
RP-643	Recomb. Hemagglutinin Influenza A Virus H3N2 Wyoming 3/03	Pure protein
RP-644	Recomb. Hemagglutinin Influenza A Virus H9N2 Hong Kong 1073/99	Pure protein
RP-645	Recomb. Hemagglutinin Influenza A Virus H1N1 California/06/2009	Pure protein
RP-647	Recomb. Hemagglutinin Influenza A Virus H3N2 Wisconsin 67/05	Pure protein
SP-58255-5	Influenza A NP (366 - 374) Strain A/NT/60/68	Pure Peptide
SP-68060-5	Influenza A NP (366 - 374) Strain A/PR/8/35	Pure Peptide
SP-86620-5	Influenza A NP (366 - 374)	Pure Peptide
HA1B011-25	**Recomb (HEK) purified Influenza B HA1 protein (B/Texas/6/2011) 16-362aa, >95%, his-tag)**	**Rec. Protein**
HA2B011-25	Recomb (HEK) purified Influenza B HA2 protein (B/Florida/4/2006) 362-555aa, >95%, mouse Fc-tag)	Rec. Protein
HA2B012-M	Mouse monoclonal anti-Influenza B HA2 protein IgG (reacts with B strains)	Rec. Protein
INFB15-M	Mouse Anti-Influenza B IgG, aff pure	Antibodies
MA-20171	Mouse Monoclonal Anti-Human Influenza B virus Nucleoprotein	Antibodies
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)	Virus/inactivated
RP-1593	Recomb. (insect cells) Hemagglutinin Influenza B Virus Malaysia 2506/04 (HA full length, insect cells)	Pure Protein
RP-646	Recomb HA Influenza B Virus Ohio 01/05 (HA full length, insect cells)	Pure protein
RP-648	Recom. HA Influenza B Virus Jilin 20/03 (HA full length, insect cells)	Pure protein

Universal Influenza A (M2) 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 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**). 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. 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.

Universal Influenza A M2-based vaccines:



A "**universal vaccine**" is the one that would not have to be designed and made for each flu season. The challenge is to identify single antibody that could neutralize many subtypes of the virus, so that they could be useful in any season, and that target conserved domains that are resistant to antigenic drift. Another option is to find the conserved antigens, and delivering groups of these antigens to provoke an immune response.

M2 protein in influenza A is encoded by gene segment 7. M2 contains 97 amino acids and is expressed from a spliced mRNA derived from the M1 mRNA. M1 and M2 share the first nine amino acids at their NH2-termini. M2 functions as viroporin. M2 is a tetrameric type III membrane protein (2-24 aa, the extracellular N-terminal domain M2e; the transmembrane (TM) domain (positions 25–46) and the intracellular C-terminal domain (positions 47–97). The 23-aa **influenza M2 protein** remains unchanged over multiple cycles of mutations in the flu virus, and it is considered as a good candidate to make a **"universal vaccine".** M2 is a structural protein that is also abundantly expressed on the surface of infected cells. Influenza A virus infection of humans induces a **weak anti-M2 antibody** response that is of short duration. Several novel approaches are being tested to enhance the antigenicity of M2e-protein and produce a viable vaccine: These included inclusion of several different antigens, presented different ways (as fusion proteins, mounted on virus-like particles, on non-pathogenic viruses, as DNA, and others, are under development.

Human Influenza A strains

consensus M2e sequence	SLLTEVET PIRNEWGCRCNDSS D
A/Brevig_Mission/1/1918 H1N1	SLLTEVET PTRNEWGCRCNDSS D
A/Puerto Rico/8/1934 H1N1	SLLTEVET PIRNEWGCRCNGSS D
A/Chile/13/1957 H2N2	SLLTEVET PIRNEWGCRCNDSS D
A/Japan/170/1962 H2N2	SLLTEVET PIRSEWGCRCNDSS D
A/An Arbor/7/1967 H2N2	SLLTEVET PIRNEWGCRCNDSS N
A/Aichi/2/68 H3N2	SLLTEVET PIRNEWGCRCNDSS D
A/England/878/1969 H3N2	SLLTEVET PIRNEWGCRCNDSS N
A/Caracas/1/1971 H3N2	SLLTEVET PIRKEWGCRCNDSS D
A/Taiwan/3/71 H3N2	SFLTEVET PIRNEWGCRCNDSS D
A/Aichi/69/1994 H3N2	SLLTEVET PIRNEWECRCNGSS D
A/Wuhan/359/95 H3N2	SLPTEVET PIRSEWGCRCNDSS D
A/Wisconsin/10/98 H1N1	SLLTEVET PIRNGWECKCNDSS D
A/New York/497/2003 H1N1	SLLTEVET PIRNEWGCRCNDSS D
A/New York/378/2005 H3N2	SLLTEVET PIRNEWGCRCNDSS D

Acambis universal flu vaccine (**ACAM-FLU-A™**) based on **three M2e domains** presented on **HepB core antigen**. Dynavax has developed a **vaccine N8295** based on two highly conserved antigens NP and M2e and their TLR9 agonist.

The **VAX102** vaccine by Vaxinnate Corp. is a recombinant fusion protein which contains **four tandem copies of the M2e** antigen linked to ***Salmonella typhimurium*** **flagellin**, using a TLR5 ligand as an adjuvant. The **M2-OMPC** conjugate vaccine by Merck appeared highly effective in inducing an immunogenic response in ferrets, mice and monkeys. This conjugate was observed to provide 90-100% protection in Balb/c mice when challenged with LD90 of A/Puerto Rico/8/34 (PR8; H1N1) and A/Hong Kong/68xPR8 ressortant (HKxPR8; H3N1) post-immunization. **Universal Influenza A vaccine still remains a dream.**

About ADI's Universal M2e Vaccines ELISA Kits - The primary objective of M2e-based universal vaccines it to induce a powerful antibody response against M2 protein that will neutralize a variety of Influenza A stains. ADI has developed M2E antibody ELISA Kits for humans and animals that will be useful to determine the efficacy of various vaccines and test new vaccines. Antibody ELISA kits for M2e-carrier proteins (HepB, flagellin, and OMPC are also available). ADI is further expanding the antibody ELISAs to measure IgA, IgG (and IgG1, IgG2a, IgG3, IgG4) and IgM classes.

Influenza A Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2943

Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Monkey	Rabbit	Others
Influenza (Universal Vaccine)	M2	Ab	IgA	920-200-MHA	920-220-MMA	920-380-MKA	920-240-MRA	Ch, Sw
			IgG	920-205-MHG	920-225-MMG	920-385-MKG	920-245-MRG	920-320-MCG (Ch)
			IgM	920-210-MHM	920-230-MMM	920-390-MKM	920-250-MRM	920-325-MCM (Ch)

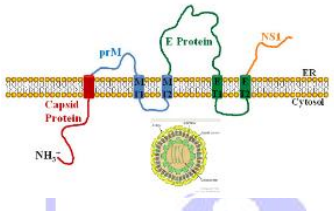
Notes: Ch=Chicken; Sw=Swine

Related Items

OMPC15-R-50	Recombinant (E. coli) Outer membrane protein C Recombinant Protein (ompC/omp1b/porin, 22-367 aa, E. coli, >95%)
FLGN11-M	Mouse monoclonal anti-flagellin protein (Fla/Flic/BOR) IgG
FLGN15-R-50	Recombinant (E.Coli) purified Borrelia Flagellin p41 (Fla protein/BOR)
FLGN16-N-50	Flagellin from B. subtilis Fla protein/BOR), purified
FLGN17-N-50	Flagellin from S. typhimurium Fla protein/BOR), purified
FLGN18-N-10	Recombiant (E. coli) Flagellin (flaA) from Listeria monocytogenes (1-287, his-tag, >95%)
HBVC11-M	Mouse Anti-Hepatitis B Virus core antigen (HBcAg) IgG
HBVC15-R-25	Recombinant (E. coli) Hepatitis B Virus core antigen (HBcAg) (1-183aa, 18 kda, >95%)
Influenza-A-M2e-Universal-Vaccine-ELISA-Flr	160607A

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

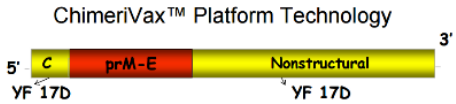
Japanese encephalitis—previously known as Japanese B encephalitis to distinguish it from von Economo's A encephalitis—is a disease caused by the mosquito-borne Japanese encephalitis virus (**JEV**). The Japanese encephalitis virus is a virus from the family Flaviviridae. Domestic **pigs and wild birds** 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. JEV 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. Mental retardation developed from this disease usually leads to coma. Mortality of this disease varies but is generally much higher in children. 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.



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 ssRNA 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 (NS1-5). NS1 is produced as secretory form also. NS3 is a putative helicase, and NS5 is the viral polymerase.

All current **vaccines** are based on the genotype III virus. Infection with JEV confers life-long immunity. 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). 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. The live, attenuated yellow fever virus (**YFV) strain 17D vaccine** has been used safely and effectively in over 500 million individuals over the past 70 years. Demand for yellow vaccine for preventive campaigns has increased from about 5 million doses per year to a projected 62 million per year by 2014. 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. ChimeriVax™ platform encoding two structural proteins (**prM and E**) of yellow fever 17D vaccine virus replaced by corresponding genes from attenuated **JE strain** (SA14-14-2). Recombinant envelop protein-based vaccines are also being developed. This vaccine may also be suitable for DIVA testing as the presence of JEV-NS1 antibodies will only be present in naturally infected individuals.



About ADI JEV Vaccine ELISA Kits - ADI's JEV vaccine ELISA utilizes highly purified recombinant JEV virus Env, prM, and NS1 as antigens to detect anti-JEV Ig's. These kits will also help determine the efficacy of various existing vaccines and test new vaccines. Antibody ELISA kits for species or subtype not listed here can also be made available.

JEV Vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2778

Items Description	Species	IgG Cat#	IgM Cat#
JEV **Envelop** Protein/E Antibody ELISA kits, 96 tests, quantitative	Mouse	910-100-JEG	910-105-JEM
	Human	910-110-JEG	910-115-JEM
	Monkey	910-120-JEG	910-125-JEM
JEV **prM** Antibody ELISA kits, 96 tests, quantitative	Mouse	910-130-JEG	910-135-JEM
	Human	910-140-JEG	910-145-JEM
	Monkey	910-150-JEG	910-155-JEM
JEV **NS1** Antibody ELISA kits, 96 tests, quantitative	Mouse	910-160-JEG	910-165-JEM
	Human	910-170-JEG	910-175-JEM
	Monkey	910-180-JEG	910-185-JEM

JEV Recombinant protein & Antibodies kits

	Catalog#	Product Description	Product Type
JEV-Env	JEV11-C	Recom. JEV envelop protein E protein control for Western blot	Western control
	JEV11-S	Mouse Anti-Rec. Japanese Encephalitis Virus (JEV) envelop protein E (JEV-EP) antiserum	Antibodies
	JEV12-S	Anti-Rec. Japanese Encephalitis Virus (JEV) envelop protein E (JEV-EP) antiserum	Antiserum
	JEV14-M	Monoclonal Anti-Rec. Japanese Encephalitis Virus (JEV) envelop protein E (JEV-EP) Supt.	Antibodies
	JEV15-R-10	Recomb. JEV envelop protein E (JEV-EP, full length), purified (>95%)	Recom. Protein
	JEV16-R	Recombinant (E. coli) Japanese Encephalitis Virus (JEV) Envelop (50 kda >95%)	Recom. Protein
JEV-prM	JEV13-C	Recombinant (E. coli) Japanese Encephalitis Virus (JEV) prM protein control for Western blot	
	JEV13-M	Monoclonal Anti-Rec. Japanese Encephalitis Virus (JEV) prM protein IgG	Antibodies
	JEV17-R	Recombinant (E. coli) Japanese Encephalitis Virus (JEV) prM protein (50 kda >95%)	Recom. Protein
JEV-NS1	JEV18-R	Recomb. (HEK) JEV NS1 protein (50 kda >95%, V5 tag, ~46 kda)	Recom. Protein
	JEV15-M	Mouse Monoclonal Anti-Japanese Encephalitis Virus (JEV) NS1 protein E (JEV-NS1) IgG.	Antibodies

JEV_Vaccine_Flr 160612A

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

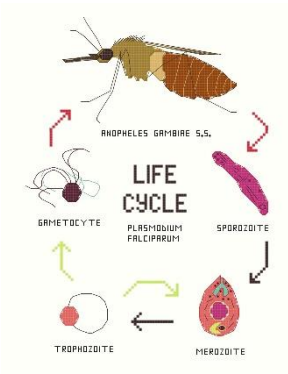
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2743

Items Description	Species	IgG Cat#	IgM Cat#	IgA Cat#
KLH Vaccine (antibody) ELISA kits	Human	700-140-KLG	700-145-KLM	
	Mouse	700-130-KLM 700-130-KLM (IgA+G+M)		
	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	
	Bovine	700-130-KLM	700-205-KLM	700-210-KLA

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

KLH_Vaccine_Flr 160612A

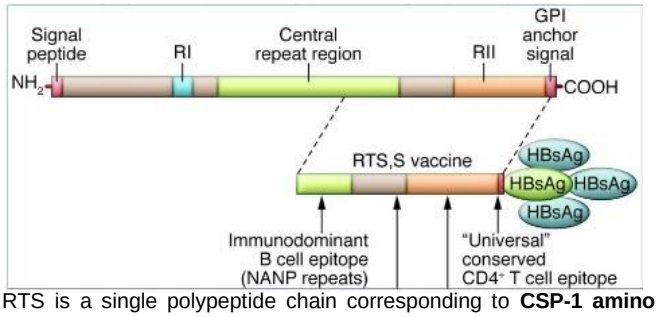


Malaria is a parasitic disease spread by mosquitoes. It affects about ~500 millions of people worldwide and killing an estimated 1 million annually. The causative agent, the parasitic protozoan **Plasmodium**, is transmitted by mosquitoes. Four Plasmodium species infect humans. These are **Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale and Plasmodium malariae**. **Plasmodium berghei** infects rodents.

P. falciparum is the most common cause of infection and is responsible for about 80% of all malaria cases, and is also responsible for about 90% of the deaths from malaria. Parasitic Plasmodium species also infect **birds, reptiles, monkeys, chimpanzees and rodents**. There have been documented human infections with several simian species of malaria, namely P. knowlesi, P. inui, P. cynomolgi, P. simiovale, P. brazilianum, P. schwetzi and P. simium; however, with the exception of P. knowlesi, these are mostly of limited public health importance.

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. 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 addition of GSK's proprietary Adjuvant Systems (**AS01/AS02/QS21/Mpla** etc) aims to further improve the immune response. 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. 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. However, no association between anti-circumsporozoite antibody titres and clinical malaria has been identified.

Merozoite surface protein 1 (MSP-1) of the malaria parasite is an important molecule involved in invasion of erythrocytes. In Plasmodium falciparum, MSP-1 is synthesized as a large precursor on the surfaces of merozoites. Proteolytic cleavage of MSP-1 leaves a C-terminal 19-kDa fragment (MSP-119) on the surface of the parasite, which is necessary for invasion of the erythrocyte. The remaining fragments are shed as a soluble complex. The C-terminal MSP-119 region is functionally conserved across species of the genus Plasmodium, and its tertiary structure is maintained by disulfide bridges. Immunization with MSP-119 of P. falciparum MSP-1, or its equivalent in rodent parasites, is able to generate protective immunity, and development of MSP-1 as a potential vaccine has, therefore, concentrated on this region of the molecule

About ADI's Malaria Vaccine ELISA Kits - 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. Antibody ELISA kits for RTS,S vaccine carrier protein (HBsAG) are also available to assess the efficacy of the vaccine.

Malaria Related Reagents and ELISA kits

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

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
RTS,S Malaria Vaccine (CSP-Antibody, *P. falciparum*) ELISA Kits	Rabbit	970-200-CSR	970-210-CSM
	Mouse	970-300-MMG	970-310-MMM
	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.

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#	Product Description	Product Type
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 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, 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 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	Pure Peptide

Malaria_Vaccine_Flr.doc Rev. 160607A

Malaria Vaccine-Duffy-Binding like5 (DBL5) Domain Antibodies and ELISA Kits

Pregnancy-associated malaria (PAM) caused by Plasmodium falciparum sequestration in the intervillous spaces of placenta leads to poor outcomes for pregnant women and their babies. PAM is a major cause of severe maternal anaemia contributing to maternal mortality. In addition, PAM is the most important factor contributing to premature delivery, hypertension, infant anaemia and neonatal mortality. Rapid disease detection and control is necessary to preserve the integrity of research animals. ADI now offers the most sensitive, simple, and rapid ELISA kits for the **detection of DBL5 antibodies**. The ELISA kits are supplied with pre-coated plate sufficient for 96 tests or 480 tests, -ve and +ve controls and all required reagents. **ADI DBL5 antibody ELISA produced results in 105 min at room temp and has a high sensitivity of 1 ng DBL5 antibody in infected animals.**

ELISA Kits	Species	IgG	IgM
DBL5/VAR2CSA antibody ELISA Kits, Quantitative	Human	970-510-DBG	970-515-DBM
	Mouse	970-530-DBG	970-535-DBM
	Monkey	970-540-DBG	970-545-DBM

Ordering Information-DBL5/VAR2CSA protein and antibodies

http://www.4adi.com/commerce/catalog/spcategory.jsp?category_id=2941

Catalog#	Product Description	Product T ype
DBL55-R-10	Recombinant (E. coli) Duffy Binding like5 (DBL5/VAR2CSA) Domain protein for ELISA/Western (>95%, ~45 kda, his-tag)	Recomb. Protein
DBL51-C	Recombinant Duffy Binding like5 (DBL5/VAR2CSA) Domain protein (45 kda) control for Western	Recomb. Protein
DBL51-A	Rabbit Anti-Duffy Binding like5 (DBL5/VAR2CSA) Domain protein IgG	Antibodies

Duffy- Binding like5 (DBL5) Domain–General Information

Malaria is the deadliest parasitic disease causing 500 million serious cases and 2 million deaths each year. People living in endemic countries develop partial immunity after multiple disease episodes, and this immunity correlates with acquisition of strain-specific antibodies that recognize *Plasmodium falciparum* Erythrocyte Membrane Protein 1(PfEMP1). *Plasmodium falciparum* binds carbohydrate molecules to recognize, attach and invade cells both in the human and mosquito hosts. The particular virulence of this parasite is largely the result of its ability to sequester in the vascular bed. Pregnant women are particularly susceptible to malaria as the placenta provides a new target for the adhesion of infected erythrocytes.

Pregnancy-associated malaria (PAM) is a serious consequence of sequestration of *Plasmodium falciparum*-parasitized erythrocytes (PE) in the placenta through adhesion to chondroitin sulfate A (CSA) present on placental proteoglycans, leading to inflammation and block of blood flow to the developing child. CSA binding has been linked to the expression of the **Variant surface antigen2-CSA (var2CSA)** variant of *P. Falciparum* Erythrocyte Membrane Protein 1(PfEMP1), a family of parasite adhesins presented on the surface of PE and displaying diverse specificities to host cell receptors. Of the approximately 60 variants comprising the PfEMP1 family, var2CSA is one of the most conserved between different parasite strains and at least one orthologue gene is consistently found in parasite isolates. Var2CSA is expressed on the surface of placental infected erythrocytes (IEs) and mediates adherence to CSA. Several indications support **var2CSA as a vaccine candidate for PAM**. PAM is an important cause of morbidity and mortality in sub-Saharan Africa; it causes ~20,000 maternal deaths each year and likely contributes to the deaths of 100,000 – 200,000 infants.

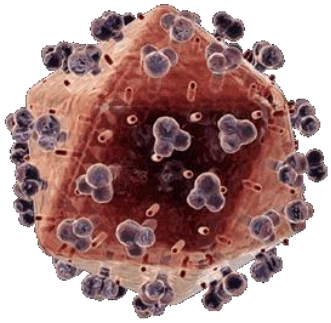
Var2CSA is a large transmembrane protein (~350 kDa) expressed on the PE surface. The extra-cellular region can be divided into six **Duffy-binding like domains (DBL)** folded with multiple disulfide bonds and four interdomain regions (**ID**). Antibodies raised by immunization with recombinant DBL domains are cross-reactive with different placental parasite strains and can inhibit binding of PE to CSA. VAR2CSA DBL3, DBL4, and DBL5 domains are slightly more conserved than other extracellular domains (82-88% amino acid identity versus 60-80% for other domains). Within the parasite panel, DBL3 sequences averaged 87% amino acid identity (range 81-91%) and **DBL5** sequences had 86% amino acid identity (range 83-99%). Thus, despite the presence of sequence polymorphisms, VAR2CSA DBL3 and DBL5 domains contain cross-reactive epitope(s) that are widely geographically distributed in different CSA binding parasite lines. The DBL5 domain is naturally immunogenic, and antibodies are acquired following placental infection with *P. falciparum.*

Pregnancy malaria vaccine development has been highly focused on binding inhibitory antibodies. VAR2CSA-DBL5 displays highly strain-transcendent epitopes that suggests a role for additive or synergistic vaccine strategies that would combine both broad adhesion-blocking and opsonizing antibody responses to prevent high-density placental infections associated with disease.

About ADI DBL5 ELISA Kits - ADI has pruduced recombinant protein DBL5, made antibodies, and developed antibody ELISA kits. The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulated new Vaccines. Antibodies ELISA kits are available Antibody ELISA kits for other species and isotypes not listed here can be made availabel as well.

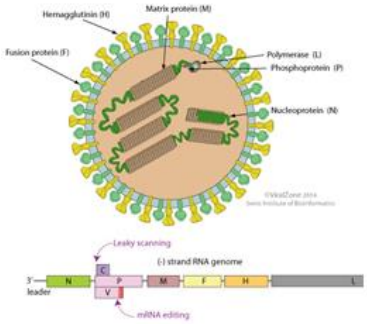
Malaria-Vaccine-VAR2CSA-DBL5-Flr 160607A

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. Morbilliviruses, like other paramyxoviruses, are enveloped, ssRNA 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.

Measles virus (**MeV**) is a single-stranded, negative-sense, enveloped (non-segmented) RNA virus (15-16 kb) encoding 8 proteins. The virus is highly contagious and is spread by coughing and sneezing via close personal contact or direct contact with secretions. The measles virus has two envelope glycoproteins on the viral surface—**hemagglutinin (H)** and membrane **fusion protein (F).** These proteins are responsible for host cell binding and invasion. Three receptors for the H protein have been identified to date: complement regulatory molecule CD46, the signaling lymphocyte activation molecule (SLAM) and the cell adhesion molecule Nectin-4. 8 clades of measles (A–H). Subtypes are designed with numerals—A1, D2 etc. Currently a total of 23 subtypes are recognised. Despite the variety of measles genotypes, there is only one measles serotype. Antibodies to measles bind to the



haemagluttinin protein, therefore antibodies against one genotype (such as the vaccine strain) are protective against all other genotypes.

Measles affects about 20 million people a year, primarily in the developing areas of Africa and Asia. 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**). **MMR II vaccine** (Merck) is a live virus vaccine for vaccination against measles (rubeola), mumps, and rubella (German measles). 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 **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.

About ADI Measles vaccine LISA Kits - The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulate new Vaccines. Antibody ELISA kits for species and isotypes not listed here can be made availabel as well.

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 virus proteins 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

Catalog#	Product Description	Product Type
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
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
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
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
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

Measles_Vaccine_Flr 160608A

Neisseria Meningitis Vaccine (A, C, W-135, and Y) ELISA Kits

Meningitis (Greek for membrane) is an acute inflammation of the protective membranes covering the brain and spinal cord, known collectively as the **meninges**. The meninges comprise three membranes that, together with the cerebrospinal fluid, enclose and protect the brain and spinal cord (the central nervous system). 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. Meningitis can lead to serious long-term consequences such as deafness, epilepsy, hydrocephalus, or cognitive deficits, especially if not treated quickly. Outbreaks of bacterial meningitis occur between December and June each year in an area of sub-Saharan Africa known as the **meningitis belt**. In bacterial meningitis, bacteria reach the meninges by one of two main routes: through the bloodstream or through direct contact between the meninges and either the nasal cavity or the skin.

Neisseria meningitides, often referred to as meningococcus, is a **gram negative bacterium** that can cause meningitis and other forms of meningococcal disease such as meningococcemia, a life-threatening sepsis. The bacterium is referred to as a coccus because it is round, and more specifically, **diplococcus** because of its tendency to form pairs. As an exclusively human pathogen it is the main cause of bacterial meningitis in children and young adults, causing developmental impairment and death in about 10% of cases. N. meningitidis is spread through saliva and respiratory secretions during coughing, sneezing, kissing, and chewing on toys. Disease-causing strains are classified according to the antigenic structure of their polysaccharide capsule. Serotype distribution varies markedly around the world. Among the **13 identified capsular types of N. meningitidis, six (A, B, C, W135, X, and Y)** account for most disease cases worldwide. Type **A** has been the most prevalent in **Africa and Asia**, but is rare/ practically absent in North America. In the United States, **serogroup B** is the predominant cause of disease and mortality, followed by serogroup C.

Meningococcal vaccine refers to any of the vaccines used to prevent infection by Neisseria meningitidis. Different versions are effective against some or all of the following types of meningococcus: A, C, W135, and Y. The vaccines are between 85 and 100% effective for at least two years. It is on the World Health Organization's List of Essential Medicines. There are **several vaccines** available:
Quadrivalent (A, C, W, Y) or **bivalent** (C, Y, combination with Hib) and monovalent (A). **Meningococcal vaccines** are either conjugated or non-conjugated (see table below). The duration of immunity mediated by **non-conjugated vaccines** is three years or less, whereas **conjugated vaccines** provide enhanced protection, and effective herd immunity.

About ADI's Meningitis (A, C, W, Y) ELISA Kits - ADI has various serotype specific antigens (carbohydrates), made antibodies, and developed antibody ELISA kits. The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulated new Vaccines. Antibodies ELISA kits are available Antibody ELISA kits for other species and isotypes not listed here can be made availabel as well. Antibody ELISA kits for meningitis vaccine carier proteins (Diphtheria toxoid, Tetanus toxoid) are also available. ADI has also introduced simple, rapid and visual identification test kits for meningitis vaccines that can be performed in 15-45 mins at room temp with no technical skills or instruments (Vac-ID™ series). The Vac-ID™ kits will help prevent mislabeling, fraud, and to confirm the activity of potency of finished vaccines.

Vaccine	Manufacturer	Active Vaccine Ingredients	Conjugating proteins
Menactra (MC4)	Sanofi	Meningococcal A, C, Y, and W-135 polysaccharides	Diphtheria Toxoid (DT)
Menveo	Novartis	Meningococcal A, C, Y, and W-135 polysaccharides	DT mutant CRM197
NmVac4	JNI	Meningococcal A, C, Y, and W-135 polysaccharides	Diphtheria Toxoid (DT)
MenHibrix	GSK	Meningococcal **C and Y**/Hib-PRP polysaccharides	Tetanus Toxoid (TT)
Menomune (MPSV-4)	Sanofi	Meningococcal A, C, Y, and W-135 polysaccharides	None
Mencevax	GSK	Meningococcal A, C, Y, and W-135 polysaccharides	None
MenAfriVac	Serum instit.	Meningococcal **A**	Tetanus toxoid

Meningitis Vaccine ELISA kits

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

Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Rabbit
Meningitis (A/C/W/Y) Antibody ELISA kits	Polysach-A	Ab	IgG	600-800-AHG	600-805-AMG	600-810-ARG
	Polysach-C		IgG	600-820-AHG	600-825-AMG	600-830-ARG
	Polysach-W		IgG	600-840-AHG	600-845-AMG	600-850-ARG
	Polysach-Y		IgG	600-860-AHG	600-865-AMG	600-870-ARG
	A+C+W+Y combo	Ab	IgG	600-880-XHG	600-885-XMG	600-890-XRG
			IgG1	600-881-IG1	600-886-IG1	
			IgG2	600-882-IG2	600-887-IG2	
			IgA	600-883-IGA	600-888-IGA	
			IgM	600-884-IGM	600-889-IGM	600-894-XRM
	C+Y Combo	Ab	IgG	600-895-AHG		

Meningitis Carrier Proteins ELISA kits

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

ELISA kits for Meningitis Carrier Protein

Items Description	Kit Type	Human cat#	Mouse cat#	Rabbit cat#
Meningitis Vaccine Diphtheria Toxoid (DT/conj. protein) IgG ELISA Kits	IgG (DT)	940-100-DHG	940-120-DMG	940-130-DRG
Meningitis Vaccine Diphtheria CRM197 (conj. protein) IgG ELISA Kits	IgG (CRM197)	940-200-DHG	940-220-DMG	940-230-DRG
Meningitis Vaccine Tetanus Toxoid (TT/ conj. protein) IgG ELISA Kits	IgG (TT)	930-100-TTH	930-130-TMG	930-210-TRG

Meningitis Vaccine Antigen ELISA Kits

Items Description	**Kit Type**	**Human cat#**
Meningitis Vaccine Group A Oligosaccharides antigen ELISA kit	Antigen A	#600-80A-AG1 (96 tests, quantitative)
Meningitis Vaccine Group C Oligosaccharides antigen ELISA kit	Antigen C	#600-81C-AG1 (96 tests, quantitative)
Meningitis Vaccine Group W-135 Oligosaccharides antigen ELISA kit	Antigen W	#600-82W-AG1 (96 tests, quantitative)
Meningitis Vaccine Group Y Oligosaccharides antigen ELISA kit	Antigen Y	#600-83Y-AG1 (96 tests, quantitative)
Meningitis Vaccine Diphtheria Toxoid (DT) antigen ELISA kit	Antigen DT	#940-DTX-AG1 (96 tests, quantitative)
Meningitis Vaccine Tetanus Toxoid (TT) antigen ELISA kit	Antigen TT	#930-TTX-AG1 (96 tests, quantitative)

Meningitis Vaccine Identification (Vac-ID) Kits

Vac-ID™ Meningococcal Vaccines Identification Kit (a rapid and simple ELISA to confirm the presence of active ingredients in finished vaccines)	Vaccine ID	600-VID-Men-48 (48 test, ~30-40 min test) 600-VID-Men-96 (96 tests)

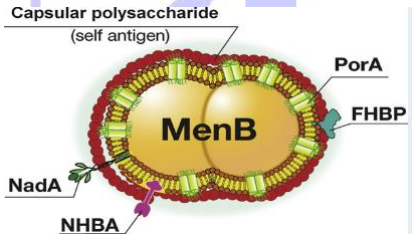
Catalog#	Product Description	Product Type
MENA11-S	Anti-Meningococcal Group A Oligosaccharides-Diphtheria CRM197 conjugate antiserum	antiserum
MENA12-S	Anti-Meningococcal Group CWY Oligosaccharides-Diphtheria CRM197 conjugate antiserum	antiserum
MENA13-S	Anti-Meningococcal Group ACWY Oligosaccharides-Diphtheria CRM197 conjugate antiserum	antiserum
MENA14-BT	Anti-Meningococcal Group ABC serotypes antigens IgG-biotin conjugate	Antibodies
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
MENA15-N-100	Meningococcal Group A Oligosaccharides-Diphtheria CRM197 conjugate control for ELISA	Antigen
MENA25-N-100	Meningococcal Group CWY Oligosaccharides-Diphtheria CRM197 conjugate control for ELISA	Antigen
MENA35-N-100	Meningococcal Group ACWY Oligosaccharides-Diphtheria CRM197 conjugate control for ELISA	Antigen

Meningitis_Vaccine_Flr.pdf 160607

Meningitis/Meningococcal Serogroup B (MenB) Vaccine & ELISA Kits

Meningococcal meningitis, a form of meningococcal disease, which is a serious bacterial infection, is caused by bacteria called ***Nisseria meningitidis*** also known as meningococcus. It causes meningitis, meningococcemia, septicemia, and rarely carditis, septic arthritis, or pneumonia. 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. *N. meningitides* colonizes the mucosa of the nasopharynx in 5 to 10% of the population, and in susceptible individuals the bacterium can cross the epithelial layer into the bloodstream, causing septicemia and/or meningitis. Meningitis is life-threatening because of the inflammation's proximity to the brain and spinal cord; therefore the condition is classified as a medical emergency. *Neisseria meningitidis* has 13 clinically significant serogroups 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.

The distribution of the serogroups varies globally; large epidemics in Africa have been generally associated with serogroup A. **Serogroup B**, which are generally absent in sub-Saharan Africa, are the primary concern in **industrialized countries**. MenB, a leading cause of bacterial meningitis in industrialized countries, remains as an important unmet public health challenge. Europe, US, Canada and Australia experience the highest rates of meningococcal disease caused by serogroup B. Global incidence of MenB infection is estimated to be between 20,000 and 80,000 cases per year, with a 10% fatality rate even with appropriate treatment.



The capsular polysaccharide of Men B is a self-antigen that cannot be used to make a vaccine as it is not well recognized by the immune system as an antigen and therefore does not induce an immune response. Outer membrane proteins have been used as antigens for vaccines against MenB in the past. However, these proteins vary greatly by strain and they are observed to be strain specific.

The **Men B vaccine** contains 4 antigens that were prioritized based on their ability to induce broad protection. The proteins that met these criteria were called **Genome-derived Neisseria Antigens:** GNA2132 (Neisserial Heparin Binding Antigen, or **NHBA**), GNA1870 (factor H binding protein, or **fHbp)** and GNA1994 (Neisseria adhesin A or **NadA**). Two additional antigens, GNA2091 and GNA1030, were also selected because they induced protective immunity but only in some of the assays. The antigens were combined in a **multi component vaccine** with the aim of inducing better and broader protection. Fusion proteins were generated in order to facilitate large-scale manufacturing of the vaccine.

Bexsero® a four-component vaccine (called **4CMenB**) is the first broadly effective **MenB vaccine** for all age groups, including infants who are among the most vulnerable. This vaccine prevents disease caused by serogroup B. **FHbp** (282 aa protein, ~28 kda) binds human factor H, enhancing the ability of the bacterium to resist complement-mediated killing.

NadA (362a.a) is an adhesin which exhibits homology with a family of proteins involved in invasion and pathogenesis. **NHBA, 427 a.a, 43.3 kDa**) NHBA (or GNA2132, 427 a.a) is a surface-exposed lipoprotein which binds heparin in vitro through an arginine-rich region. **Porin A** (**PorA, 36.4 kDa)** is the most abundant antigen which is variable and induces only strain-specific protection. Por A determines the serosubtype of Neisseria meningitidis, and is the main antigen of a candidate vaccine against serogroup B meningococci, which has been shown to induce high-avidity antibodies in children.

About ADI Men-B vaccine LISA Kits - ADI has pruduced recombinant proteins that are used in Men-B, made antibodies, and developed antibody ELISA kits. The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulat new Vaccines. Antibody ELISA kits for species and isotypes not listed here can be made availabel as well.

List of Meningitis ELISA Kits available from ADI.

Product details, data sheets, and pricing available (http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2797)

Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Rabbit
Meningitis B Antibody ELISA kits	NadA	Ab	IgG	600-900-HNG	600-905-MNG	600-960-RNG
	fHbp		IgG	600-910-HFG	600-915-MFG	600-965-RFG
	NHBA		IgG	600-920-HHG	600-925-MHG	600-970-RHG
	PorA		IgG	600-930-HPG	600-935-MPG	600-975-RPG
	PorA+ NADA+fHbp+NHBA		IgG	600-950-H4G	600-955-M4G	600-980-R4G

Men-B Recombinant Proteins and Antibodies

MBFH11-HNC	Human MenB fHbp antibody negative control serum
MBFH11-HPC	Human MenB fHbp antibody positive control serum
MBFH11-S	Rabbit Anti-MenB fHbp protein antiserum
MBFH15-R-10	Recomb. (E.coli) MenB fHbp (hig tag, 35 kDa >95%)
MBNA21-HNC	Human MenB Nad A antibody negative control serum
MBNA21-HPC	Human MenB Nad A antibody positive control serum
MBNA21-S	Rabbit Anti- MenB Nad A antiserum
MBNA25-R-10	Recomb. (E.coli) MenB NadA protein (his tag, 36 kDa)
MBNH31-HNC	Human MenB NHBA antibody negative control serum
MBNH31-HPC	Human MenB NHBA antibody positive control serum
MBNH31-S	Rabbit Anti-MenB NHBA antiserum
MBNH35-R-10	Recomb. (E.coli) MenB NHBA (his tag, 43 kDa.)
MBPA41-HNC	Human MenB PorA antibody negative control serum
MBPA41-HPC	Human MenB PorA antibody positive control serum
MBPA41-S	Rabbit Anti- MenB PorA antiserum
MBPA45-R-10	Recomb. (E.coli) Purified MenB PorA (his tag, 36kDa)

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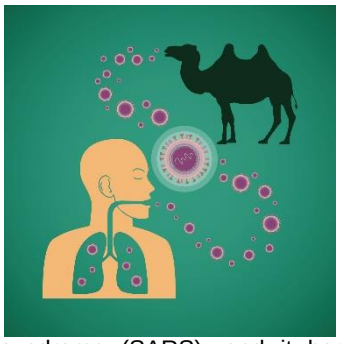
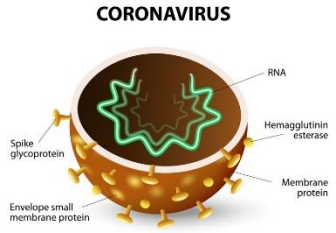
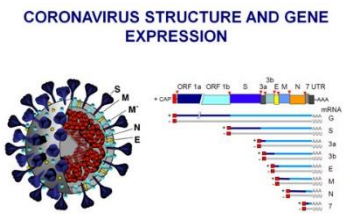


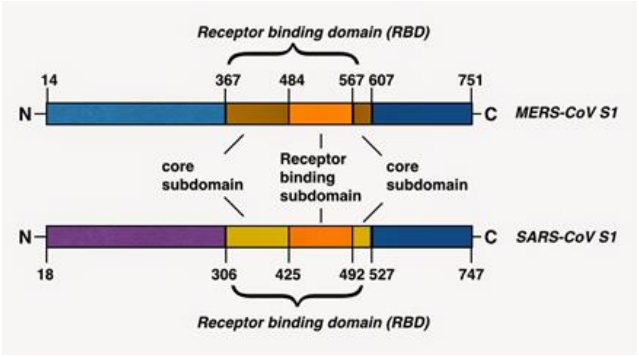
MERS is a viral respiratory infection caused by the newly identified MERS-coronavirus (**MERS-CoV**). MERS-CoV is a **betacoronavirus** derived from bats. Camels have been shown to have antibodies to MERS-CoV, but the exact source of infection in camels has not been identified. Early reports compared the virus to severe acute respiratory syndrome (SARS), and it has been referred to as **Saudi Arabia's SARS-like virus**. MERS can range from asymptomatic disease to severe pneumonia leading to the acute respiratory distress syndrome. MERS have high fatality rate, 77 deaths in 187 confirmed cases. MERS-CoV cases have been reported in several countries, including Saudi Arabia and the United States. 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. Human or animal **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.

About ADI's MERS ELISA Kits - 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.

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

Items	Kit Type	ELISA Type IgG Cat#							
		Human	Camel	Bat	Pig	Cow	Goat/sheep	Cat	Dog
MERS NP	Ab	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-S1	Ab	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-S2	Ab	RV-402300-1	RV-402310-1	RV-402320-1	RV-402330-1	RV-402340-1	RV-402350-1		
MERS S1-RBD	Ab	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/WB	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-NP (1-413 aa, His-tag, ~47 kda, low Endotoxin, >95%)	Rec. Protein
	MERSNP16-R-10	Recom (E. coli) MERS-CoV -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	Recomb. (HEK) 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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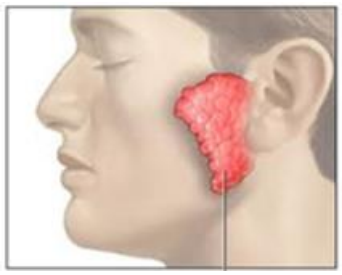
Mumps Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

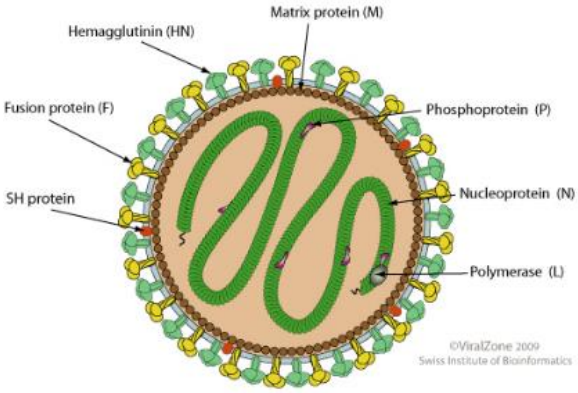


Mumps and epidemic **parotitis** is a viral disease of the human species, caused by the **mumps virus (MuV)**. Painful swelling of the salivary glands (classically the parotid gland) is the most typical presentation. Painful testicular swelling (orchitis) and rash may also occur. The symptoms are generally not severe in children. Mumps is a contagious disease that is spread from person to person through contact with respiratory secretions such as saliva from an infected person.

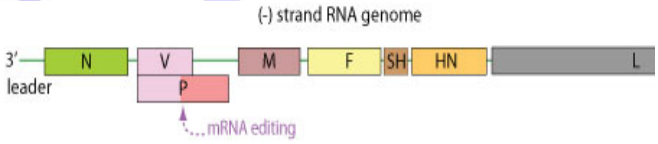
In developed countries, most children are immunized against measles by the age of 18 months, generally as part of a three-part **MMR vaccine** (measles, mumps, and rubella. **MMR II vaccine (Merck)** is a live virus vaccine for vaccination against measles (rubeola), mumps, and rubella (German measles). 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. 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. Several strains are used to vaccinate against mumps. These include the strains Jerryl Lynn, L-Zagreb, Leningrad-3 and Rubini and Urabe.

The mumps virus belongs to the genus Rubulavirus in the family Paramyxovirus (15.3 Kb, ssDNA). There are 8 viral proteins.



Ribonucleoprotein (RNP) complex: a single-stranded, linear RNA genome coated by nucleocapsid proteins (NP) in association with an RNA polymerase complex of both large (L) and phosphoprotein (P) subunits. It has been estimated that over 2,000 such NP molecules coat the genome along with about 250 P and 25 L molecules. Virus



attaches to host cell surface receptors through HN glycoprotein. Although there is only one serotype, there are currently 12 genotypes A-N, (namely A, B, C, D, F, G, H, I, J, K, L, N) excluding (E and M). L-Zagreb vaccine strain comes under genotype N, jerryl Lynn and Rubini belong to genotype A, Urabe is genotype B. It is not clear yet if there is any clinical significance to the genotypes.

About ADI Mumps vaccine LISA Kits - The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulate new Vaccines. Antibody ELISA kits for species and isotypes not listed here can be made availabel as well.

Mumps vaccine Related ELISA kits

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

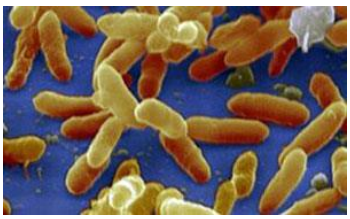
ELISA Kit Description	Species	IgG Cat#	IgM Cat#	IgA Cat#
Mumps Vaccine antibody ELISA kits	Human	520-100-HMG	520-110-HMM	520-120-HMA
	Mouse	520-130-MMG	520-140-MMG	520-150-MMG

Mumps Antibodies and recombinant proteins

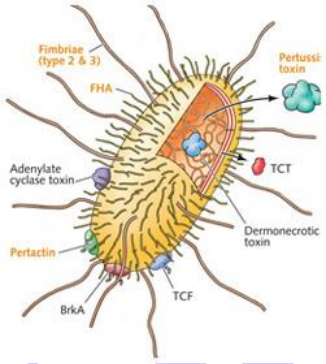
Catalog#	Product Description	Product Type
520-100-01N	Human Anti-Mumps Virus (parotitis) IgG negative control serum	Disease serum, Human
520-100-02P	Human Anti-Mumps Virus (parotitis) IgG positive control serum	Disease serum, Human
520-130-05N	Mouse Anti-Mumps Virus (parotitis) IgG negative control serum	Disease serum, Animal
520-130-06P	Mouse Anti-Mumps Virus (parotitis) IgG positive control serum	Disease serum, Animal
520-160-03N	Monkey Anti-Mumps Virus (parotitis) IgG negative control serum	Disease serum, Human
520-160-04P	Monkey Anti-Mumps Virus (parotitis) IgG positive control serum	Disease serum, Human
MUMS11-S	Anti-Mumps virus (Enders) Virus antiserum	Antibodies
MUMS11-SB	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 160523A

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



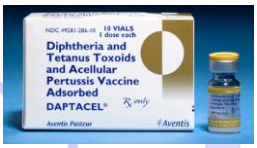
Pertussis, also known as the **whooping cough**, is a highly contagious disease caused by the bacterium **Bordetella pertussis**. It derived its name from the "whoop" sound made from the inspiration of air after a cough. Despite generally high coverage with the DTP and DTaP vaccines, pertussis is one 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 vaccines contain between one and five B. pertussis antigens**: pertussis toxin (Ptx), filamentous hemagglutinin (FHA), pertactin (Prn), and fimbriae (Fim2 and Fim3). Many aspects of the pathogenesis of pertussis and vaccine correlates of protection are poorly understood. However, antibodies to all components of pertussis antigens (PTX, Prn, FHA and Fim) appear to have a direct correlation with protection.

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. **Pertussis toxin (PTX)** 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.

FHA) is one of two hemeagglutinins produced by phase I strains of B. pertussis. On a weight basis, FHA is five to seven times more active in hemeagglutination (HA) assays than is pertussis toxin. FHA is a protein with an approximate molecular weight of 200 Kda. **Fimbriae** have been considered important vaccine components for many years in both whole-cell and acellular vaccines. B. pertussis expresses two serologically distinct fimbriae composed of either **Fim2** (207-aa; 22.5 kda) or **Fim3** (204-aa, 22 kda) major subunits. Antibody responses to Fim1-3 have been observed in human samples.



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.

About ADI's Pertussis Vaccine ELISA Kits - 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	ELISA Kit Type	Species	Total IgG Cat#	IgM Specific Cat#	IgA Specific Cat#
B. pertussis whole vaccine (Pertussis Toxin, FHA and LPS) antibody ELISA	Ab	Human	960-110-PHG	960-220-PHM	960-200-PHA
		Mouse	960-120-PHG	960-225-PHM	960-205-PHA
		Monkey	960-210-PHG	960-220-PHM	
B. pertussis vaccine (Toxin/toxoid) Antibody ELISAs	Ab	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	Ab	Mouse	960-230-PGG		
		Rabbit	960-240-PRG		
		Human	960-250-PHG		
		Monkey	960-260-PMG		
B. pertussis vaccine Filamentous hemagglutinins (FHA) Antibody ELISAs	Ab	Human	960-340-FHG	960-350-FHM	
		Mouse	960-300-FMG	960-310-FMM	
		Rabbit	960-320-FRG	960-330-FRM	
B. pertussis vaccine Fimbrae 2/3 (Fim2/3) Antibody ELISAs	Ab	Human	960-370-FIG	960-375-FIM	
		Mouse	960-360-FIG	960-365-FIM	

Pertussis Vaccine Antigen ELISA kits

Description	ELISA Kit Type	
B. pertussis Vaccine (Pertussis Toxin, PT/PTOX) Antigen ELISA	Antigen	**#960-PTX-AG1**; PTX ELISA for the measurement PTX in biological buffer, 96 tests
		#VAC-PTX-50; VacciGel Direct ELISA for the measurement of Pertussis Toxoid in Vaccines formulated in Alum
B. pertussis Vaccine (FHA) Antigen ELISA	Antigen	**#960-FHA-AG1**; **FHA** ELISA for the measurement PTX in biological buffer
B. pertussis Pertactin (PRN) Antigen ELISA	Antigen	**#960-PRN-AG1**; **PRN** ELISA for the measurement PTX in biological buffer

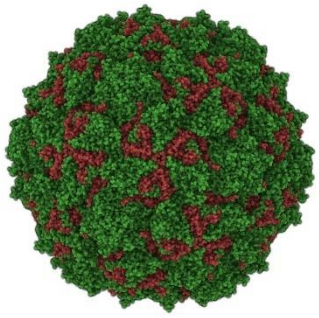
Pertussis Vaccine Related Antibodies, Proteins and other Reagents

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

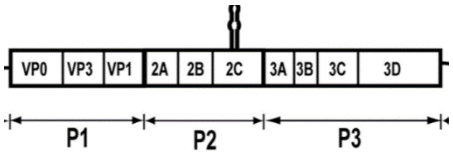
Item	Catalog#	Product Description	Product Type
Filamentous hemeagglutinin (FHA)	FHA11-S	Rabbit Anti-B. pertussis Filamentous hemeagglutinin (FHA) protein antiserum	Antibodies
	FHA15-N-10	Filamentous Hemeagglutinin (FHA) (B. pertussis), purified	Pure protein
	FHA21-S	Rabbit Anti-B. pertussis Filamentous 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

Pertussis_Vaccine_Flr 160612A

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, about 3% of cases the virus enters the central nervous system, preferentially infecting and destroying motor neurons, leading to muscle weakness and acute flaccid paralysis.



The term **poliomyelitis** is used to identify the disease caused by any of the **three serotypes of poliovirus**. 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. Detection of virus in the CSF is diagnostic of paralytic polio, but rarely occurs. **Poliovirus** is structurally similar to other human enteroviruses (coxsackie viruses, echoviruses, and rhinoviruses), which also use immunoglobulin-like molecules to recognize and enter host cells. There are **three serotypes of poliovirus**, **PV1, PV2, and PV3**; each with a slightly different capsid protein. Capsid proteins define cellular receptor

specificity and virus antigenicity. **PV1 is the most common** form encountered in nature, however all three forms are extremely infectious. Wild polioviruses can be found in two continents. As of 2012, PV1 is highly localized to regions in Pakistan and Afghanistan in Asia, and Nigeria, Niger and Chad in Africa. Wild poliovirus type 2 has probably been eradicated; it was last detected in October 1999 in Uttar Pradesh, India. Wild PV3 is found in parts of only two countries, Nigeria and Pakistan. S pecific strains of each serotype are used to prepare **vaccines against polio**. **Inactive polio vaccine (IPV)** is prepared by formalin inactivation of three wild, virulent reference strains, Mahoney or Brunenders (PV1), MEF-1/Lansing (PV2), and Saukett/Leon (PV3). **Oral polio vaccine (OPV)** contains live attenuated (weakened) strains of the three serotypes of poliovirus. Passaging the virus strains in monkey kidney epithelial cells introduces mutations in the viral IRES, and hinders (or attenuates) the ability of the virus to infect nervous tissue.

Poliovirus capsid protein VP1 is one of four structural proteins and its antigenic The N-termini of most EV VP1 proteins contain highly conserved immunogenic regions that are recognized by sera from most EV-infected patients. Poliovirus VP1 has been considered a candidate for **recombinant poliovirus subunit vaccine.**

ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. Recombinant Polio VP1 is also utilized to develop new generation of ELISA Kits.

Polio Vaccine ELISA kits

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

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
Polio virus 1-3 (**IPOL/IPV/OPV** Vaccines) Antibody ELISA Kits	Human	970-100-PHG	
	Mouse	970-120-PMG	
	Rabbit	970-130-PRG	970-130-PRM
	Monkey	970-150-PMG	
	Rat	970-180-PRG	
Polio virus 1 (Sabin) VP1 protein Antibody ELISA Kits	Mouse	970-160-VPG	
	Rabbit	970-165-VPG	
	Human	970-170-VPG	

Polio Related Antibodies, Peptides, and Recombinant Proteins Ordering Information

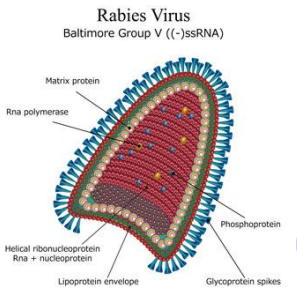
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2727

Catalog#	Product Description	Product Type
POLV11-S	Anti-Poliomyelitis Viruses 1-3 (IPOL/IPV vaccine: Mahoney, MEF-1, and Saukett) antiserum	Antibodies
POLV12-M	Mouse monoclonal Anti-Poliomyelitis Virus 1-3 IgG, aff pure	Antibodies
POLV13-A	Anti-Poliomyelitis Virus 1-3 IgG	Antibodies
POLV13-FITC	Anti-Poliomyelitis Virus 1-3 IgG-FITC Conjugate	Antibodies
POLV13-HRP	Anti-Poliomyelitis Virus 1-3 IgG-HRP Conjugate	Antibodies
POLV14-M	Mouse monoclonal Anti-Poliomyelitis Virus 1 IgG, aff pure	Antibodies
POLV15-R-10	Recombinant (E. Coli) Poliomyelitis Virus 1 Viral Protein 1 (Sabin; POLV1-VP1, 302-aa; full length, >95%)	Pure Protein
POLV15-S	Anti-Poliomyelitis Virus 1 Viral Protein 1 (Sabin; POLV1-VP1) antiserum	Antibodies
POLV16-S	Anti-Poliomyelitis Virus 1 (LSc,2ab strain) antiserum, neutralizing	Antibodies
POLV21-M	Mouse monoclonal Anti-Poliomyelitis Virus 2 IgG, aff pure	Antibodies
POLV22-S	Anti-Poliomyelitis Virus 2 (P712,Ch,2ab strain) antiserum, neutralizing	Antibodies
POLV23-S	Anti-Poliomyelitis Virus 2 (sabin strain, native) antiserum, neutralizing	Antibodies
POLV31-M	Mouse monoclonal Anti-Poliomyelitis Virus 3 IgG, aff pure	Antibodies
POLV32-S	Anti-Poliomyelitis Virus 3 (Leon1,Ch,2ab strain) antiserum, neutralizing	Antibodies
POLV33-S	Anti-Poliomyelitis Virus 3 (sabin strain, native) antiserum, neutralizing	Antibodies
PVR15-R-25	Recomb. (HEK) Mouse Poliovirus receptor (PVR or CD155 or Necl-5) protein (1-345aa, hIgG1-Fc-his>95%)	Pure Protein
PVR16-R-50	Recombinant (HEK) Mouse Poliovirus receptor (PVR or CD155 or Necl-5) protein (1-345aa, His-tag, >95%)	Pure Protein
PVR17-R-25	Recomb. (HEK) Human Poliovirus receptor (PVR or CD155 or Necl-5) protein (1-345aa, hIgG1-Fc-his	Pure Protein
PVR18-R-25	Recombinant (HEK) HUman Poliovirus receptor (PVR or CD155 or Necl-5) protein (1-345aa, his-tag, >95%)	Pure Protein

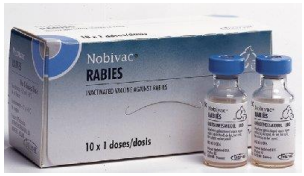
Polio_Vaccine_Flr 160619A

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

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 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.



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**. 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.**



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).

About ADI Rabies Vaccine ELISA Kits - ADI has pruduced recombinant rabies virus proteins (**VRG, NP**) that are used in vaccines, made antibodies, and developed antibody ELISA kits. The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulate new vaccines. Antibody ELISA kits for species and isotypes not listed here can be made availabel as well.

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

ELISA Kit Description	Species	IgG Specific Cat#	IgM Specific Cat#
Rabies virus (**whole viral antigens**) antibody ELISA Kits	G. Pig	600-015-GRV	
	Human	600-020-HRV	
	Mouse	600-030-MRG	
	Rabbit	600-040-RRG	600-045-RRM
	Monkey	600-070-CRG	
	Ferret (Fishers/Skunks)	600-090-FRG	
	Bat	600-095-BRG	
Rabies Virus Glycoprotein (**RVG**) antibody ELISA Kits	Human	600-120-HRV	
	Mouse	600-130-MRG	
	Rabbit	600-140-RRG	
	Ferret (Fishers/Skunks)	600-170-FRG	
	Monkey/Baboon	600-180-BRG	
Rabies Vaccine Rabies Virus **Nucleoprotein** (RV-NP antibody ELISA Kits	Human	600-220-HRV	600-225-HRM
	Mouse	600-230-MRG	
	Rabbit	600-240-RRG	
	Monkey/Baboon	600-660-BRG	

Rabies Related Antibodies, Peptides, and Recombinant Proteins

Catalog#	Product Description	Product Type
RBM2P15-R-10	Recomb. (E.coli) Rabies Virus (MRV/Genotype 1) Matrix 2 protein (~22kda, >95%,)	Pure protein
RBV11-M	Mouse monoclonal Anti-Rabies Virus IgG, aff pure	Antibodies
RBV11-S	Anti-Rabies Virus antiserum positive control for ELISA	antiserum
RBV12-FITC	Anti-Rabies Virus IgG-FITC conjugate	Antibodies
RBV12-S	Anti-Rabies Virus antiserum (hyper immune sera)	antiserum
RBV13-S	Anti-Rabies Virus antiserum	antiserum
RBV14-M	Mouse monoclonal Anti-Rabies Virus Glycoprotein IgG, aff pure	Antibodies
RBV15-FITC	Mouse monoclonal Anti-Rabies Virus IgG-FITC conjugate (DFA II mix of 2 clones)	Antibodies
RBV16-Fab2	Horse Anti-Rabies Virus IgG (Fab2), neutralizing	Antibodies
RBVGP11-C	Rabies Virus Glycoprotein (~58 kda, RVG) control for western blot	Western control
RBVGP11-S	Anti-Rabies Virus Glycoprotein (~58 kda, RVG) antiserum	antiserum
RBVGP25-R-10	Recombinant (E. coli) purified Rabies Virus Glycoprotein (~58 kda, RVG)	Western control
RBVNP12-C	Rabies Virus Nucleoprotein (RV-NP) (~56 kda, RV-NP) control for western blot	Western control
RBVNP12-S	Anti-Rabies Virus Nucleoprotein (RV-NP) (~56 kda, RV-NP) antiserum	antiserum
RBVNP15-R-10	Recomb. (E.coli) purified Rabies Virus nucleocapsid protein (full length ~56 kda)	Pure protein
RBVNP15-R-25	Recomb. (E.coli) purified RV-NP (full length ~56 kda)	Pure protein

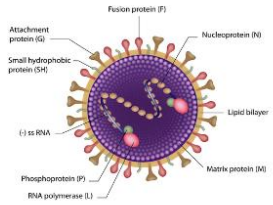
Rabies_Vaccine_Flr 160609A

Respiratory Syncytial virus (RSV) Vaccines: ELISA Kits, Recombinant Proteins, and Antibodies

Respiratory Syncytial virus (RSV) is a leading cause of severe respiratory infection in infants and children. RSV is a respiratory pathogen that infects **human** and **chimpanzees**. The severity of the disease is very diverse ranging from mild cold symptoms to severe and life-threatening. It is the most common pathogen leading to hospitalization in young children up to the age of 5. Approximately two thirds of infants are infected with RSV within their first year and 90% have been infected by the age of 2. Each year, 4-5 million children younger than 4 years acquire an RSV infection, and more than 125,000 are hospitalized annually in the United States because of this infection. RSV Infection may result from either direct or indirect contact with oral or nasal secretions from an infected person.

Specific **diagnostic tests** for confirming RSV infection include Culture, Antigen-revealing techniques, Polymerase chain reaction (PCR) assay and serology (Antigen of antibody tests by ELISA).

RSV is an enveloped, nonsegmented, negative-sense RNA virus. The RSV genome is a single strand of RNA (~15 Kb) that encodes a major viral protein. Three of these proteins are transmembrane surface proteins (**G, F, and SH**). One protein is a nonglycosylated virion matrix protein (M), and four proteins associate with the genomic RNA to form the viral nucleocapsid (**N, P, L, and M2** open reading frame 1 [M2 ORF1]). M2 ORF-2 is a second, distinct protein transcribed from the M2 gene, which has defined properties in transcriptional regulation. Finally, two proteins (**NS1 and NS2**) are nonstructural viral products that accumulate in infected cells but are present in only trace amounts in mature virions.



Therapeutics & Vaccines: High risk infants can be treated with a neutralizing antibody to RSV (**palivizumab or Synagis**®) to reduce the risk of severe RSV illnesses. Palivizumab is a humanized therapeutic antibody against the RSV-F protein. **No approved vaccines** available. A formalin-inactivated vaccine (FI-RSV) showed poor immunity. Recombinant vaccine that is suitable for intranasal instillation is being tested in the chimpanzee, which is the only known animal that develops a respiratory illness similar to humans. Novavax is testing RSV-F nanoparticle vaccine for pregnant women.

About ADI's RSV Vaccine ELISA Kits - ADI has produced recombinant **RSV-F protein** and developed ELISA kits to determine the efficacy of RSV vaccines. The use of highly purified recombinant proteins also allows the test to be more specific for RSV-F than similar kits using the whole viral proteins. ADI ELISA kits are rapid (105 min assay at room temp), sensitive (~ <1 ng/ml IgG or IgM), and quantitative.

RSV Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2938

Items Description	Species	Antibody Type IgA Cat#	Antibody Type IgG Cat#	Antibody Type IgM Cat#
RSV virus proteins Antibody ELISA kit, 96 tests, quantitative	Human	510-400-HRA	510-405-HRG	510-410-HRM
	Mouse	510-420-MRA	510-425-MRG	510-430-MRM
	Monkey	510-440-MRA	510-445-MRG	510-450-MRM
RSV-F Protein Antibody ELISA kits, 96 tests, quantitative	Human	510-300-HRA	510-305-HRG	510-310-HRM
	Monkey	510-320-MRA	510-325-MRG	510-330-MRM
	Mouse	510-340-MRA	510-345-MRG	510-350-MRM

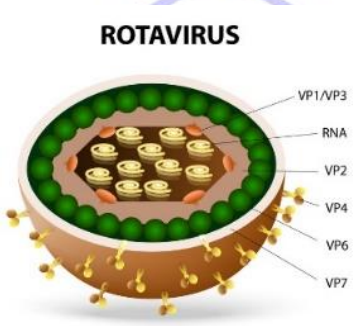
RSV Recombinant Proteins & Antibodies

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2938

Items#	Catalog#	Product Description	Product Type
RSV Virus	RSV12-S	Anti-Human Respiratory Syncytial Virus (RSV) IgG, neutralizing	Antibodies
	RSV12-FITC	Anti-Human Respiratory Syncytial Virus (RSV) IgG-FITC conjugate	Antibodies
	RSV12-BTN	Anti-Human Respiratory Syncytial Virus (RSV) IgG-Biotin conjugate	Antibodies
	RSV12-HRP	Anti-Human Respiratory Syncytial Virus (RSV) IgG-HRP conjugate	Antibodies
	RSV15-M	Mouse Monoclonal Anti-Human Respiratory Syncytial Virus (RSV, A2 strain) IgG (reacts with A & B strains)	Antibodies
RSV Fusion protein (RSV-F)	RSVF11-M	Mouse Monoclonal Anti-Respiratory Syncytial Virus Fusion protein (RSV-F, long strain) IgG, clone 1	Antibodies
	RSVF12-M	Mouse Monoclonal Anti-Respiratory Syncytial Virus Fusion protein (RSV-F, long strain) IgG, clone 2	Antibodies
	RSVF17-S	Rabbit Anti-Respiratory Syncytial Virus fusion protein (RSV-F) antiserum	Antibodies
	RSVF15-R-10	Recombinant (E. coli) Respiratory Syncytial virus fusion protein (RSV-F) (>95%, ~57 kda, his tag)	Recomb. Protein
RSV Nucleoprotein (RSV-NP)	RSVNP13-M	Mouse Monoclonal Anti-Respiratory Syncytial Virus Nucleoprotein (RSV-NP) IgG, clone 1	Antibodies
	RSVNP14-M	Mouse Monoclonal Anti-Respiratory Syncytial Virus Nucleoprotein (RSV-NP) IgG, clone 2	Antibodies
	RSVNP16-R-10	Recombinant (E. coli) Respiratory Syncytial virus nucleoprotein (RSV-NP) (>95%, his tag, 45 kda)	Recomb. Protein

Rotavirus Vaccines: ELISA Kits, Recombinant Proteins, and Antibodies

Rotavirus causes severe gastroenteritis in humans and other mammals, including **mice, rats, cow, pig**, and is readily transmitted via viral shedding in feces. Animal rotaviruses can infect humans, either by direct transmission of the virus or by contributing one or several RNA segments to reassortants with human strains. Most children in the world have been infected with rotavirus by the age of five. Immunity develops with each infection; so subsequent infections are less severe; adults are rarely affected. There are eight species of this virus, referred to as **A-H**. Humans are primarily infected by species A, B and C, most commonly by species A. A–E species cause disease in other animals. Within rotavirus A there are different strains, called serotypes. **Rotavirus A**, the most common species, causes more than **90% of rotavirus infections** in humans. The virus is transmitted by the fecal-oral route. Viral diarrhea is highly contagious. The feces of an infected person can contain more than 10 trillion infectious particles per gram; fewer than 100 of these are required to transmit infection to another person. The virus infects and damages the cells that line the small intestine and causes gastroenteritis (which is often called "stomach flu" despite having no relation to influenza).



Rotavirus is responsible for the death of 450,000 children worldwide each year. **Rotavirus B**, also called adult diarrhea rotavirus or ADRV, has caused major epidemics of severe diarrhea affecting thousands of people of all ages in China and India. **Diagnosis**: Most children admitted to hospital with gastroenteritis are tested for rotavirus A. Specific diagnosis can be made by serology (Antigen or antibodies tests by ELISA) and PCR.

The genome of rotavirus consists of 11 unique dsRNA which are 18kb 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 proteins (VP1-4, VP6-7) that form the virus particle. Nonstructural proteins (NSP1-6) are only produced in cells infected by rotavirus. **VP6** forms the bulk of the capsid (~45 kda, ~780 copies per particle). It is highly antigenic and it is used to identify rotavirus species by immunological techniques.

Therapeutics & Vaccines: High risk infants can be treated with a neutralizing antibody to RSV (**palivizumab or Synagis®**) to reduce the risk of severe RSV illnesses. Palivizumab is a humanized therapeutic antibody against the RSV-F protein. A formalin-inactivated vaccine (FI-RSV) or live attenuated vaccines showed poor immunity. There are two types of vaccine available globally, Rotarix and RotaTeq, with a number of others available in certain countries. **RotaTeq** is a live, oral pentavalent vaccine that contains five rotavirus strains produced by reassortment (A, G1, G2, G3, and G4). **Rotarix** is a monovalent, human, live attenuated rotavirus vaccine containing one rotavirus strain of G1P specificity. ROTARIX is indicated for the prevention of rotavirus gastroenteritis caused by G1 and non-G1 types (G3, G4, and G9. when administered as a 2-dose series in infants and children. Recombinant VP6-based vaccine that is suitable for intranasal instillation is being tested in the chimpanzee, which is the only known animal that develops a respiratory illness similar to humans. Novavax is testing RSV-F nanoparticle vaccine for pregnant women.

About ADI Polio Vaccine LISA Kits - ADI has pruduced recombiant rotavirus proteins that are used in vaccines, made antibodies, and developed antibody ELISA kits. The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulate new vaccines. Antibody ELISA kits for species and isotypes not listed here can be made availabel as well. ADI ELISA kits are rapid (105 min assay at room temp), sensitive (~ <1 ng/ml IgG or IgM), and quantitative.

Rotavirus ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2779

Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Monkey	Rabbit	Others
Rotavirus	VP6	Ab	IgA	AE-300432-1	AE-300402-1			
			IgG	AE-300430-1	AE-300400-1	AE-300440-1	AE-300420-1	AE-300410-1 (rat)
			IgM	AE-300431-1	AE-300401-1			

AE-300460-1	RecombiVirus Sheep EDIM/rotavirus VP6 antibody IgG ELISA Kit, 96 tests
AE-300470-1	RecombiVirus Porcine rotavirus VP6 antibody IgG ELISA Kit, 96 tests

Rotavirus Recombinant Proteins & Antibodies

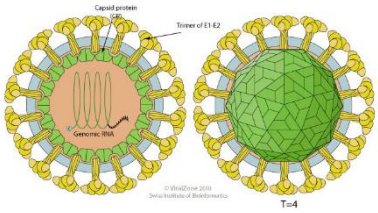
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2779

Catalog#	Product Description	Product Type
EDIM11-MNC	Mouse Anti- EDIM/Rotavirus Capsid Protein 6 (VP6) antibody negative control serum	Disease Animal serum
EDIM11-MPC	Mouse Anti- EDIM/Rotavirus Capsid Protein 6 (VP6) antibody positive control serum	Positive control serum
EDIM12-RNC	Rat Anti- EDIM/Rotavirus Capsid Protein 6 (VP6) antibody negative control serum	Disease Animal serum
EDIM12-RPC	Rat Anti- EDIM/Rotavirus Capsid Protein 6 (VP6) antibody positive control serum	Positive control serum
EDIM14-C	Recombinant EDIM/Rotavirus Capsid Protein 6 (VP6) control for Western blot	Pure Protein
EDIM14-S	Rabbit Anti- EDIM/Rotavirus Capsid Protein 6 (VP6) antiserum	Antiserum
EDIM15-M	Mouse monoclonal Anti- EDIM/Rotavirus Capsid Protein 6 (VP6) IgG, aff pure	Antibodies
EDIM15-R-10	Recombinant (E. coli) EDIM/Rotavirus Capsid Protein 6 (VP6), full length (>95% pure, his-tag)	Pure Protein
EDIM17-M	Mouse monoclonal Anti-Rotavirus (all serotypes) (p43/VP6) IgG, aff pure	Antibodies

Rotavirus-Vaccine-ELISA-Flr Rev. 160609A

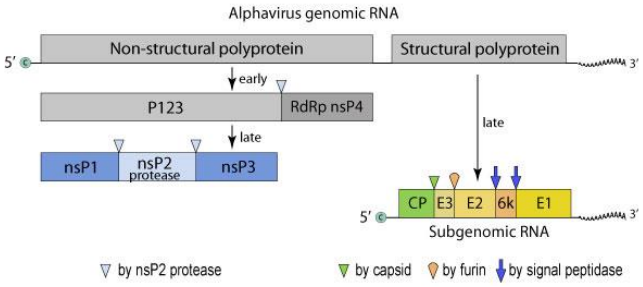
Rubella Vaccines Antibody ELISA Kits, Recombinant Proteins, Peptides and Antibodies

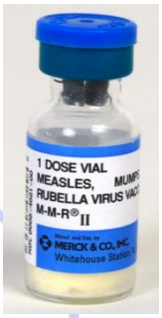
Rubella, commonly known as **German measles**, is a disease caused by the rubella virus. Rubella is a common childhood infection usually with minimal systemic upset although transient arthropathy may occur in adults. Serious complications are very rare. **Acquired (i.e. not congenital) rubella** is transmitted 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 ssRNA 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. 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 ssRNA (9.7Kb) which is enclosed by an icosahedral **capsid**. The genome 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. 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.

MMR II vaccine is a mixture of three live attenuated viruses, administered via injection. GlaxoSmithKline Biologicals as **Priorix**, Serum Institute of India as **Tresivac**, and Sanofi Pasteur as **Trimovax**. 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.

About ADI Rubella Vaccine ELISA Kits - ADI has developed antibody ELISA kits to assess immune status of humans and animals and to assess vaccine efficacy or formulate new vaccines. Antibody ELISA kits for species and isotypes not listed here can be made availabel as well.

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

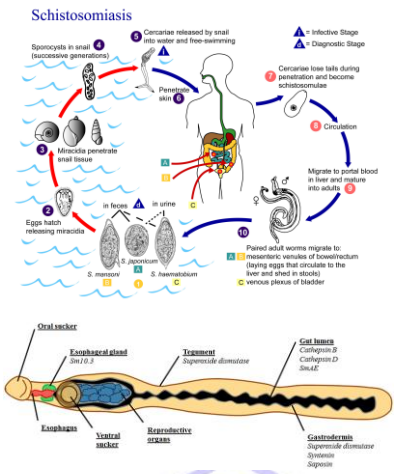
Rubella Related Antibodies, Peptides, and Recombinant Proteins Ordering Information

(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 structural 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 160609A

Schistosomiasis (Sm-p80) Vaccine-Antibody, Reagents & ELISA Kits



Schistosomiasis (also known as bilharzia, snail fever, and Katayama fever) is a disease caused by parasitic worms of the Schistosoma type. It mainly infects the urinary tract or the intestines. Symptoms include abdominal pain, diarrhea, bloody stool, or blood in the urine. Long term infection results in liver damage, kidney failure, infertility, or bladder cancer. Schistosomiasis affects almost 210 million people worldwide, and an estimated 12,000 to 200,000 people die from it every year. The disease is most commonly found in Africa, as well as Asia and South America. Intestinal Schistosomiasis is caused by Schistosoma mansoni (**S. mansoni**) and occurs in Africa, the eastern Mediterranean, the Caribbean and South America. In addition**, S. intercalatum** causes a form of intestinal Schistosomiasis that has been reported in central African countries. Yet another form of intestinal Schistosomiasis, known as Oriental or Asiatic, is caused by the **S. japonicum** group of parasites (including **S. mekongi** in the Mekong river basin). S. japonicum is endemic to South-East Asia and the western Pacific region. Finally, S. **hematobium** is responsible for urinary Schistosomiasis and is endemic to Africa and the eastern Mediterranean.

Species of Schistosoma that can infect humans:

- S. mansoni (ICD-10 B65.1) and S. intercalatum (B65.8) cause intestinal schistosomiasis
- S. haematobium (B65.0) causes urinary schistosomiasis
- S. japonicum (B65.2) and S. mekongi (B65.8) cause Asian intestinal schistosomiasis
- Avian schistosomiasis species cause swimmer's itch.

Species of Schistosoma that can infect other animals:

- S. bovis — normally infects cattle, sheep and goats in Africa, parts of Southern Europe and the Middle East
- S. mattheei — normally infects cattle, sheep and goats in Central and Southern Africa
- S. margrebowiei — normally infects antelope, buffalo and waterbuck in Southern and Central Africa
- S. curassoni — normally infects domestic ruminants in West Africa
- S. rodhaini — normally infects rodents and carnivores in parts of Central Africa

Schistosomiasis vaccines: Most parasites pass through different life stages in different anatomic sites of its definitive host. The parasite has learned to live for decades in the host, developed host's immune defense mechanisms and protect itself from the host immune system. So developing an effective vaccine against any parasite, including schistosome, has remained elusive. More than 100 schistosome antigens have been tested for vaccine but only 25% protein confer some protection in animal models but fall short of WHO stated goal of at least 40% protection. Several schistosome antigens such as fatty acid-binding protein of 14 kDa from S. mansoni (**FABP14/Sm14**), glutathione-S-transferase of 28 kDa (**GST28/Sh-28-GST**) from S. haematobium, S. mansoni tetraspanin 2 (**TSP-2**) have shown promise as vaccine candidate in animal model.

Host-exposed schistosome proteins that undertake essential functions (immune evasion, nutrient uptake and attachment) will be effective targets for a Schistosomiasis vaccine. **Sm-p80**, a functionally important antigen of S. mansoni plays a pivotal role in the schistosome immune evasion process. Sm-p80 is composed of a smaller subunit of **28 kDa** and a larger subunit of **78 kDa**. The large subunit was described to be localized in the parasite surface. This subunit has proteolytic activity in the presence of Ca2+ and plays an important role in immune evasion. Complete elimination of egg-induced organ pathology has been achieved using Sm-p80-based vaccine with 100% reductions in liver/intestine egg in animal model. Sm-p80 vaccination also afforded protection in mice, baboon, and hamster and protects against S. mansoni, S. japonicum, and S. haematobium. Sm-p80 vaccine is ready for human clinical trials.

Fatty Acid-Binding Protein (FABP)-14 kDa S. mansoni (Sm14) antigen is also being tested as vaccine candidate. Sm14 share significant sequence homology with a FABP15 from bovine Fasciola hepatica that causes disease in cattle and sheep leading to losses of billions of dollar. It is expected that Sm14 vaccination will provide protection against both S. mansoni and F. Hepatica.

About ADI Schistosoma Vaccine ELISA Kits - ADI has pruduced recombinant parasitic antigens that are used in vaccines, made antibodies, and developed antibody ELISA kits. The ELISA kits can be used to assess immune status of humans and animals and to assess vaccine efficacy or formulate new vaccines. Antibody ELISA kits for species and isotypes not listed here can be made availabel as well.

Schistosome **Vaccine Related ELISA kits**

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2818

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#	Antibody Type IgA Cat#
S. mansoni **parasitic antigens** Antibody ELISA kits, 96 tests, Quantitative	Human	970-700-SMG	970-705-SMM	***
	Monkey	970-710-SMG	970-715-SMM	***
	Mouse	970-720-SMG	970-725-SMM	***
S. mansoni **Sm-p80** Antibody ELISA kits, 96 tests, Quantitative	Human	970-730-SMG	970-735-SMM	***
	Monkey	970-740-SMG	970-745-SMM	***
	Mouse	970-750-SMG	970-755-SMM	***
S. Japonicum **GST28** Antibody ELISA kits, 96 tests, Quantitative	Human	970-760-SJG	970-765-SJM	***
	Monkey	970-770-SJG	970-775-SJM	***
	Mouse	970-780-SJG	970-785-SJM	***
S. Japonicum **GST28** antigen ELISA kit	800-400-GST			

***=IgA or IgE or other IgG isotypes (IgG1-4) can be ordered as custom ELISA. Please call ADI for details.

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2818

Items	Catalog #	Product Description	Product Type
S. mansoni	SM231-R-50	Recombinant (E. coli) Sm23 protein (S. mansoni, 1-218aa, His-tag >95%)	Rec. Protein
	SM251-R-100	Sm25 antigenic peptide (S. mansoni, 36-82 aa, >95%, low endotoxin)	Rec. Protein
	SM281-R-50	Recombinant (E. coli) Sm28/Smp28/GST28/GST-mu protein (S. mansoni, 1-211aa, His-tag >95%)	Rec. Protein
	SMAN11-M	Mouse monoclonal Anti-S. mansoni IgG for IF/ELISA	Mouse-mono
	SMP801-R-10	Recombinant (E. coli) Sm-p80/Calpain/CANP (S. mansoni, 1-758aa, His-tag >95%)	Rec. Protein
	SMP801-S	Anti-Sm-p80/Calpain/CANP (S. mansoni, 1-758aa, His-tag >95%) antiserum	Rabbit-Poly
S. Japonicum	SM282-R-50	Recombinant (E. coli) Sm28/Smp28/GST28/GST-mu protein (S. Japonicum, 1-211aa, no-tag >95%)	Rec. Protein
	SM282-S	Anti-Sm28/Smp28/GST28/GST-mu protein (S. Japonicum, 1-211aa) antiserum	Rabbit-Poly
	SM283-BTN	Monoclonal Anti-Sm28/Smp28/GST28/GST-mu protein (S. Japonicum) IgG-Biotin conj	Mouse-Mono
	SM283-M	Monoclonal Anti-Sm28/Smp28/GST28/GST-mu protein (S. Japonicum) IgG	Mouse-Mono
	SM283-R-50	Recombinant (Sf9) Sm28/Smp28/GST28/GST-mu protein (S. Japonicum, 1-211aa, His-tag >95%, low endotoxin)	Rec. Protein
	GST11-A	Anti-Glutathione Transferase (GST, E. coli) IgG# 1, aff pure	Rabbit-Poly
	GST11-AP	Anti-Glutathione Transferase (GST, E. coli) IgG-AP conjugate	Rabbit-Poly
	GST11-C	Recombinant purified Glutathione Transferase, GST (E. coli), WB +ve control	Western control
	GST11-R	Purified Recombinant Glutathione Transferase (E. coli) protein	Rec. Protein
	GST11-S	Anti-Glutathione Transferase, GST (S. japonicum, E. coli) antiserum # 1	Rabbit-Poly
	GST12-C	Recombinant purified Glutathione Transferase (GST)-Protein (S. japonicum, ~27 kda) control WB +ve control	Western control
	GST12-M	Monoclonal Anti-Glutathione Transferase, GST (S. japonicum, E. coli), ascites	Mouse-Mono
	GST13-A	Anti-Glutathione Transferase (GST, S. japonicum) IgG# 3	Goat-Poly
	GST13-AS	Anti-Glutathione Transferase (GST, S. japonicum) IgG-Agarose (Aff matrix)	Goat-Poly
	GST13-BTN	Anti-Glutathione Transferase (GST, S. japonicum) IgG-Biotin Conjugate	Goat-Poly
	GST13-FITC	Anti-Glutathione Transferase (GST, S. japonicum) IgG-FITC Conjugate	Goat-Poly
	GST13-HRP	Anti-Glutathione Transferase (GST, S. japonicum) IgG-HRP Conjugate	Goat-Poly
	GST13-R	Purified Recombinant Glutathione Transferase-His(x6) tag (S. japonicum, GST-His) protein	Rec. Protein
	GST14-R	Purified Recombinant Glutathione Transferase-Ubiquitin fusion (S. japonicum, GST-Ub) protein	Rec. Protein
	GST15R-AS	Glutathione Transferase (GST, S. japonicum,) Protein-Agarose (Aff matrix)	Affinity support
	GST16-BTN	Monoclonal Anti-Glutathione Transferase (GST, S. japonicum, E. Coli) IgG-Biotinylated	Mono-Mice
	GST16-M	Monoclonal Anti-Glutathione Transferase (GST, S. japonicum, E. Coli) IgG#2, purified	Mouse-Mono
	GST17-R	Purified Recombinant Glutathione Transferase (GST, S. japonicum) protein, native S. Japonicum (No tag)	Rec. Protein

Schistosoma-Vaccine-ELISA-Flr 160609A

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. 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. **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 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). 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

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.

antivenoms (including all snake antivenoms) are administered intravenously; however, stonefish and redback spider antivenoms can be given 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.

Snake Anti-Venoms: Venoms, Antibodies and ELISA Kits

About ADI's Venom and Anti-venom 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, lyophilizing, 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

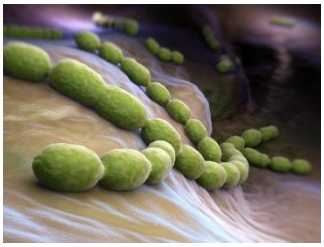
Items	Description	Cat#
Horse Ant venoms (Indian)	Horse Anti-Cobra (Naja Naja) Antibody ELISA Kits	570-100-CHG
	Horse Anti- Indian Krait (Bungarus Caeruleus) Antibody ELISA Kits	570-110-KHG
	Horse Anti- Russell's Viper (Vipera Russelli) Antibody ELISA Kits	570-120-RHG
	Horse Anti- Saw Scaled Viper (Echis 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
Sheep	Sheep/Ovine Fab ELISA kit (measure total concn of antivenom Fab)	7610-Fab
	Sheep/Ovine Antivenom Fc residue/contamination measurement ELISA	7615-Fc
Horse	Horse/Equine Fab ELISA kit (measure total concn of antivenom Fab)	7710-Fab
	Horse/Equine Antivenom Fc residue/contamination measurement ELISA	7715-Fc
	Horse Fab2 ELISA Kit, 96 tests, Quantitative	7710-Fab
	Horse IgG-Fc ELISA Kit, 96 tests, Quantitative	7715-Fc
	Horse IgA ELISA Kit, 96 tests, Quantitative	7720
	Horse IgG ELISA Kit, 96 tests, Quantitative	7730
	Horse IgM ELISA Kit, 96 tests, Quantitative	7740
	Horse IgE ELISA Kit, 96 tests, Quantitative	7750
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

Please refer to the complete list of snake venom antibodies on our website at: http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2782

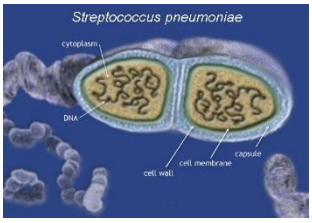
Catalog#	Product Description	Product Type
APVS11-S	Anti-Black Mocassin (Agistron piscovirus) venom antiserum	Antibodies
APVS12-S	Chicken Anti-Black Mocassin (Agistron piscovirus) venom antiserum	Antibodies
APVS14-S	Sheep Anti-Black Mocassin (Agistron piscovirus) venom antiserum	Antibodies
CADM11-S	Anti-Eastern Diamondback (Crotalus adamanteus) venom antiserum	Antibodies
CADM12-S	Anti-Eastern Diamondback (Crotalus adamanteus) venom antiserum	Antibodies
CADM14-S	Sheep Anti-Eastern Diamondback (Crotalus adamanteus) venom antiserum	Antibodies
CATX11-S	Anti-Western Diamondback Rattlesnake (Crotalus atrox) venom antiserum	Antibodies
CATX12-S	Chicken Anti-Western Diamondback Rattlesnake (Crotalus atrox) venom antiserum	Antibodies
CATX14-S	Sheep Anti-Western Diamondback Rattlesnake (Crotalus atrox) venom antiserum	Antibodies
CATX15-S	Anti-Common N. American (Diamondback, copperhead and Mocacassin snakes) venom antiserum	Antibodies
CATX16-S	Chicken Anti- N. American (Diamondback, copperhead and Mocacassin snakes) venom antiserum	Antibodies
CATX17-S	Sheep Anti- N. American (Diamondback, copperhead and Mocacassin snakes) venom antiserum	Antibodies
CKT11-S	Anti-Indian krait (Bungarus caeruleus) venom antiserum	Antibodies
CKT12-S	Chicken Anti-Indian krait (Bungarus caeruleus) venom antiserum	Antibodies
CKT13-S	Horse Anti-Indian krait (Bungarus caeruleus) venom antiserum	Antibodies
ICO11-S	Anti-Indian Cobra (Naja naja) venom antiserum	Antibodies
ICO12-S	Chicken Anti-Indian Cobra (Naja naja) antiserum	Antibodies
ICO13-S	Horse Anti-Indian Cobra (Naja naja) venom antiserum	Antibodies
RVR11-S	Anti-Russell's Viper (Vipera russelli) venom antiserum	Antibodies
RVR12-S	Chicken Anti-Russell's Viper (Vipera russelli) venom antiserum	Antibodies
RVR13-S	Horse Anti-Russell's Viper (Vipera russelli) venom antiserum	Antibodies
SSV11-S	Anti-Saw-scaled Viper (Echnis carinatus) venom antiserum	Antibodies
SSV12-S	Chicken Anti-Saw-scaled Viper (Echnis carinatus) venom antiserum	Antibodies
SSV13-S	Horse Anti-Saw-scaled viper (Echis crinatus) venom antiserum	Antibodies
VNM11-S	Anti-Common Asian (Cobra, Crait, Russell's and Saw-scaled vipers) venom antiserum	Antibodies
VNM12-S	Chicken Anti-Common Asian (Cobra, Crait, Russell's and Saw-scaled vipers) venom antiserum	Antibodies
VNM13-S	Horse Anti-Common Asian (Cobra, Crait, Russell's and Saw-scaled vipers) venom antiserum	Antibodies

Streptococcus Pneumoniae Vaccines: ELISA Kits, Carbohydrates and Antibodies



Streptococcus pneumoniae, or pneumococcus, is a Gram-positive, alpha-hemolytic, aero tolerant anaerobic member of the genus Streptococcus. 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. Genetic information can vary up to 10% between strains. 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.

Pneumococcal vaccines. 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 Prevnar 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. **Conjugated vaccine** (Prevnar, Synoflorix) consists of capsular polysaccharides covalently bound to the **diphtheria toxoid CRM197**, which is highly immunogenic but non-toxic. Among other things, this results in mucosal immunity and eventual establishment of lifelong immunity after several exposures.

About ADI S. Pneumonia vaccine ELISA - 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 individual or a group of serotype antibody kits that are not listed.

Streptococcus Pneumoniae Vaccines Related ELISA kits

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

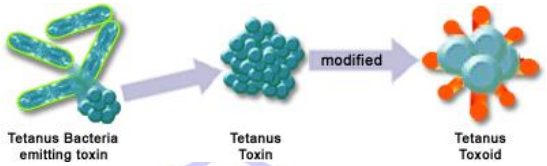
Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Rabbit
Streptococcus Pneumonia	5 Serotypes (6A, 7F, 14, 18C, and 19F)	Ab	IgG			560-230-C5G
			IgM			560-235-C5M
	Prevnar-7/PCV-7 (7 serotypes)	Ab	IgA	560-116-07A	560-106-07A	560-125-07A
			IgG	560-110-07M	560-100-07G	560-120-07G
			IgM	560-115-07M	560-105-07M	560-125-07M
	Synflorix/PCV-10 (10-serotypes)	Ab	IgA	560-146-10A	560-136-10A	
			IgG	560-140-10G	560-130-10G	560-150-10G
			IgM	560-145-10M	560-135-10M	560-155-10M
	PCV-13 (13-serotypes)	Ab	IgA		560-166-13A	560-306-13A
			IgG	560-170-13G	560-160-13G	560-300-13G
			IgM	560-175-13M	560-165-13M	560-305-13M
	Pneumovax/PCV-23 (23-serotypes)	Ab	IgA	560-189-23A	560-181-23A	560-316-23A
			IgG	560-190-23G	560-180-23G	560-310-23G
			IgM	560-195-23M	560-185-23M	560-315-23M
	6B	Ab	IgG	560-210-6BG	560-200-6BG	560-220-6BG
			IgM			560-225-6BM
	23F	Ab	IgG		560-200-23F	560-310-23G
	*CWPS/22F (non-specific)	Ab	IgG	560-410-C22	560-430-C22	560-420-C22
			IgM	560-415-C22	560-435-C22	560-425-C22
Diphtheria CRM197 (Carrier Protein)	CRM197	Ab	IgG	940-200-DHG	940-220-DMG	940-230-DRG
			IgM	940-210-DHM	940-225-DMM	560-425-C22

*Note: All human anti-PnS antibody ELISA kits are tested after adsorbing with proprietary immunosorbent prepared with common wall serotype (CWPS) and 22F

Streptococcus_Pneumonia_Vaccine_Flr.pdf Rev. 160619A

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 **vaccination** 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 toxin is inactive inside the bacteria, but when the bacteria die, it is released and activated by proteases. 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.

Tetanus vaccines available that can be used alone or in combination with other diseases (multivalent). **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.

About ADI's Tetanus ELISA Kits - ADI has developed tetanus antibody ELISA Kits for humans and animals that will be useful to determine the efficacy of various existing vaccines and test new vaccines. ADI has also introduced **industry's first ELISA for direct testing of tetanus Toxoid adsorbed on Alum** (for vaccine identification and testing). ELISA kits for antibody subtypes or species not listed can also be provided.

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	930-100-TTH	930-105-TTM	930-090-TTA
	Mouse	930-130-TMG	930-140-TMM	930-120-TMA
	Rat	930-150-TMG	930-155-TMG	
	Rabbit	930-210-TRG	930-220-TRM	
	G. Pig	930-310-TGG	930-320-TGM	
	Monkey	930-410-TKG	930-415-TKM	
VacciGel Direct ELISA for the measurement of Tetanus Toxoid (TTX) in Vaccines formulated in Alum, 96 tests, Cat # VAC-TTX-50				
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

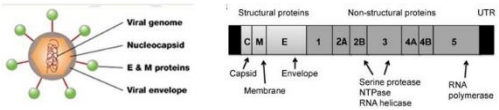
Catalog#	Product Description	Product Type
RP-343	Recombinant (E.Coli) Anti-Tetanus Toxoid scFv IgG	Antibodies
SP-66125-5	Tetanus toxin (TT) peptide (AA: Gln-Tyr-Ile-Lys-Ala-Asn-Ser-Lys-Phe-Ile-Gly-Ile-Phe-Glu)	Pure Peptide
SP-86741-1	TET 830 modified/T - helper epitope from tetanus toxoid	Pure Peptide
TTOX11-A	Anti-C. tetani Toxin/Toxoid protein IgG	Antibodies
TTOX12-A	Anti-C. tetani purified toxin IgG (tetanus shock toxin)	Antibodies
TTOX13-M	Monoclonal Anti-C. tetani purified toxin/toxoid IgG (tetanus shock toxin)	Antibodies
TTOX14-HP	Monoclonal Anti-C. tetani toxin IgG-HRP Conjugate (100X)	Antibodies
TTOX14-M	Monoclonal Anti-C. tetani purified toxin IgG (tetanus shock toxin)	Antibodies
TTOX15-N-1000	Tetanus Toxoid from C. tetani purified ((700-1200 Lf/ml; cGMP vaccine grade, Low Endotoxin)	Protein
TTOX15-N-25	Tetanus Toxoid from C. tetani purified	Protein
TTOX15-S	Anti-C. tetani purified toxin IgG (tetanus shock toxin)	Antibodies
TTOX16-NC	Mouse Anti-C. tetani toxin light chain IgG negative control serum	Disease serum
TTOX16-PC	Mouse Anti-C. tetani toxin light chain IgG positive control serum	Disease Serum
TTOX17-PC	Mouse Anti-C. tetani toxin Light-chain antibody positive control for ELISA	Disease Serum
TTOX17-R-10	Recombinant purified tetani toxin Light-chain	Pure Protein
TTOX17-S	Anti-C. tetani toxin Light-chain antiserum	Antibodies
TTOX18-A	Anti-C. tetani purified toxin/Toxoid IgG (Tetanus antitoxin, neutralizing, 300 IU/ml)	Antibodies
TTOX19-A	Anti-C. tetani purified toxin/Toxoid IgG (Tetanus antitoxin, neutralizing, 750 IU/ml)	Antibodies
TTOX20-Fab2	Anti-C. tetani purified toxin/Toxoid IgG (Fab2), Tetanus antitoxin (neutralizing)	Antibodies
TTOX21-R-10	Recomb. (P. fluorescens) tetani toxin C-terminal fragment (~52 Kda, >95% pure, low endotoxin)	Pure Protein

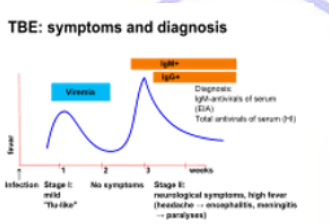
Please contact ADI for custom testing of animal and human samples.

Tetanus_Vaccine_Flr.doc Rev. 160611A

Tick-borne Encephalitis Virus (TBEV) Vaccines: ELISA Kits, Recombinant Proteins, and Antibodies

Tick-borne encephalitis (TBE) is a human viral infectious disease involving the central nervous system. TBE is caused by the tick-borne encephalitis virus (**TBEV**), a member of the family Flaviviridae, and was initially isolated in 1937. TBEV is known to infect a range of hosts including **ruminants, birds, rodents, carnivores, horses and humans**. Three **virus sub-types** are described: **European** or **Western** tick-borne encephalitis virus, **Siberian** tick-borne encephalitis virus, and **Far-Eastern** Tick-borne encephalitis virus (formerly known as Russian Spring Summer encephalitis virus, RSSEV). The family Flaviviridae includes several tick-borne viruses affecting humans.





TBE can also be acquired by ingesting unpasteurized dairy products (such as milk and cheese) from infected goats, sheep, or cows. Approximately 5,000–13,000 TBE cases are reported each year, with large annual fluctuations. Russia has the largest number of reported cases. TBE is most often manifested as a two-phased illness. The first phase is associated with symptoms like fever, fatigue, headache, muscular ache and nausea. The second phase involves the neurological system with symptoms of meningitis and/or encephalitis.

TBE genome consists of ssRNA (10-11kb) that encodes 3 structural proteins (**Capsid, prM, and Envelope**) and 8 non-structural proteins (NS1-5). The envelope glycoprotein induces neutralizing and hemagglutination-inhibition antibodies and is the most important antigen for providing protection from disease.

TBE can only be diagnosed accurately isolating the virus from the blood, PCR, and the detection of specific IgM and IgG serum antibodies by ELISA. There is no specific antiviral treatment for TBE; therapy consists of supportive care and management of complications.

No **TBE vaccines** are licensed or available in the United States. Two **inactivated cell culture-derived TBE vaccines** are available in Europe, in adult and pediatric formulations: **FSME-IMMUN** (Baxter, Austria) and Encepur (Novartis, Germany). Immunogenicity studies suggest that the European and Russian vaccines should provide cross-protection against all 3 TBE virus subtypes.

About ADI's TBEV ELISA Kits - ADI has developed TBEV antibody ELISA kits to determine the efficacy of TBE vaccines and to screen birds, animals or humans for TBE infections (NS1 antibody). Recombinant proteins and antibodies to TBEV are also available to facilitate research on TBEV vaccine. ADI ELISA kits are rapid (105 min assay at room temp), sensitive (~ <1 ng/ml IgG or IgM), and quantitative. The use of highly purified recombinant proteins also allows the test to be more specific for TBEV than similar kits using the whole viral proteins.

Tick-borne Encephalitis Virus (TBEV/FSME) Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2939

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
TBEV (whole viral proteins) Antibody ELISA kits, 96 tests, qualitative	Human	910-800-THG	910-805-THM
	Mouse	910-810-TMG	910-815-TMM
TBEV NS1 Antibody ELISA kits, 96 tests, quantitative	Mouse	910-820-THG	910-825-THM
	Human	910-830-TMG	910-835-TMM

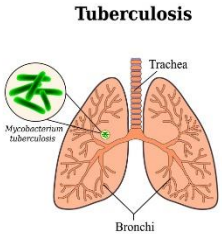
TBEV Recombinant Proteins & Antibodies

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2939

Catalog#	Product Description	Product Type
RP-1426	Recombinant (E. Coli) Tick-Borne Encephalitis Virus (TBEV) gE (>95%, 95-229)	RP-1426
RP-1427	Recomb. (E. Coli) Tick-Borne Encephalitis Virus (TBEV) gE (>95%, N-terminus regions)	RP-1427
RP-1428	Recombinant (E. Coli) Tick-Borne Encephalitis Virus (TBEV) gE middle (>95%, 50-250)	RP-1428
RP-1429	Recombinant (E. Coli) Tick-Borne Encephalitis Virus (TBEV) gE C-end (>95%, 296-414)	RP-1429
RP-1430	Recombinant (E. Coli) Tick-Borne Encephalitis Virus (TBEV) Core (capsid)	RP-1430
RP-1431	Recombinant (E. Coli) Tick-Borne Encephalitis Virus (TBEV) NS3	RP-1431
RP-1432	Recombinant (E. Coli) Tick-Borne Encephalitis Virus (TBEV) preM	RP-1432
RP-1433	Recombinant Tick-Borne Encephalitis Virus (TBEV) CE/gE	RP-1433
RP-1434	Recombinant Tick-Borne Encephalitis Virus (TBEV) NE/GE/CE/gE	RP-1434
RP-1640	Recomb. (E. Coli) Tick-Borne Encephalitis Virus NS1 (TBEV-NS1) protein (>95%, ~40 kda, his-tag)	RP-1640
TBNS11-M	Mouse monoclonal anti-Tick-Borne Encephalitis Virus (TBEV-NS1) protein IgG, aff pure	TBNS11-M
TBNS15-R-10	Recomb. (HEK) Tick-Borne Encephalitis Virus NS1 (TBEV-NS1) protein (>95%, his-tag)	TBNS15-R-10

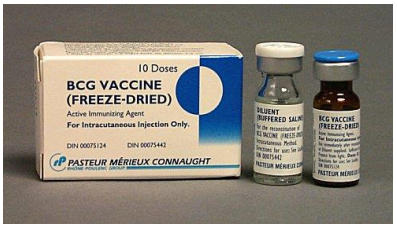
Tick-Borne-Encephalitis-Virus-Vaccine-Flr Rev. 160611A

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. Mycobacterioses (tuberculosis, leprosy, atypical mycobacterioses, paratuberculosis, and perhaps Crohn's Disease) are diseases of **humans 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. **Drug-resistant TB** is a serious public health issue in many developing countries.

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. The only currently available **vaccine** 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.** It uses the attenuated MVA as a vaccine delivery platform to present **antigen 85A** to the immune system.



Mycobacterium tuberculosis (**H37Rv** strain) has circular chromosomes of about 4,2 mln bp long and **~4000 gene**. The closely related proteins of the **antigen 85 complex**, initially identified in Mycobacterium bovis. 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 antibodies raised against individual components. Sequence analysis revealed 85% protein identity between the M. bovis BCG 85A and 85B components. 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.

About ADI's Tuberculosis ELISA Kits - ADI has developed antibody ELISA kits (BCG and individual recombinant proteins) 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. Antibody ELISA kits for species or antibody subtypes not listed here may be provided as well.

Tuberculosis vaccine Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2728

Vaccines	Target Antigens	Kit Type	Ab Type	Human	Mouse	Monkey	Rabbit
Tuberculosis Vaccine Antibody ELISA kits	M. tuberculosis antigens (18, 36, 40 kda)	Ab	IgA	990-100-THA			
			IgG	990-110-THG		990-400-MTG	
			IgM	990-120-THM		990-410-MTM	
	BCG	Ab	IgA		990-205-TMA		
			IgG	990-330-THG	990-210-TMG		990-310-TRG
			IgM	990-340-THM	990-220-TMM		990-320-TRM
	ESAT-6	Ab	IgG		990-230-06G		
			IgM		990-235-06M		
	Hspx/16Kda	Ab	IgG		990-240-16G		
			IgM		990-245-16M		
	Ag85b/38kda (MVA vaccine)	Ab	IgG	990-260-38G	990-250-38G		
			IgM	990-265-38M	990-255-38M		

Tuberculosis Vaccine Related Antibodies, Proteins and other Reagents

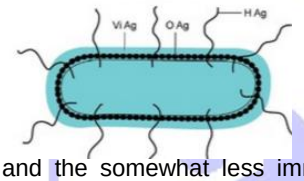
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2728

Items	Catalog#	Product Description	Product Type
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
	NALC15-1	N-Acetyl-L-cysteine (>99%, cell culture grade)	Pure chemical

Tuberculosis_Vaccine_Flr 160614A

Typhoid Vaccine (Salmonella Typhi): ELISA Kits, Recombinant Proteins, and Antibodies

Typhoid fever or **typhoid** is a common worldwide bacterial disease transmitted by the ingestion of food or water contaminated with the feces of an infected person, which contain the bacterium Salmonella enterica enterica, serovar Typhi. The disease has received various names, such as gastric fever, abdominal typhus, infantile remittant fever, slow fever, nervous fever and pathogenic fever. The name typhoid means "resembling typhus" and comes from the neuropsychiatric symptoms common to typhoid and typhus. The term enteric fever is a collective term that refers to severe typhoid and paratyphoid. The bacterium that causes typhoid fever may be spread through poor hygiene habits and public sanitation conditions, and sometimes also by flying insects feeding on feces. An estimated 16–33 million cases of typhoid fever occur annually. Its incidence is highest in children and young adults between 5 and 19 years old. These cases as of 2010 caused about 190,000 deaths up from 137,000 in 1990.



S. Typhi expresses a number of immunogenic structures on the surface, some of which provide a basis for serology identification. These include O (lipopolysaccharide), H (flagella) and the somewhat less immunogenic Vi capsule. S. Typhi exhibiting variation in these antigens are uncommon, with notable exceptions. S. Typhi found in Indonesia express variant H antigens including H:j and H:z66. Vi-negative S. Typhi isolates have been reported in Pakistan but are rare. Therefore, S. Typhi expressing O (O9, O12), Vi and H:d are ubiquitous in most endemic areas. Seroprevalence studies have been performed in endemic regions to determine antibody titers to O, H and Vi in the general population. Many individuals in endemic areas have cross-reactive antibodies even though they have no clinical record of typhoid. Additionally, such raised antibody levels frequently cannot be detected in patients with culture confirmed typhoid. Problems have also been encountered during the testing of commercial serological tests, including Typhidot and Tubex.

Diagnosis is made by any blood, bone marrow or stool cultures and with the Widal test (demonstration of salmonella antibodies against antigens O-somatic and H-flagellar). The **Widal test** is time-consuming, and often, when a diagnosis is reached, it is too late to start an antibiotic regimen. Typhidot-M is a dot enzyme immunoassay for the detection of specific IgG/IgM antibody to Salmonella typhi OMP antigen Salmonella typhi.

There are few **vaccines** licensed for use for the prevention of typhoid: **the live, oral Ty21a vaccine** (sold as Vivotif by Crucell) and the injectable **Typhoid polysaccharide vaccine** (sold as **Typhim Vi** by Sanofi Pasteur and Typherix by GlaxoSmithKline). Both are 50% to 80% protective and are recommended for travelers to areas where typhoid is endemic. There exists an **older, killed-whole-cell vaccine** that is still used in countries where the newer preparations are not available, but this vaccine is no longer recommended for use because it has a higher rate of side effects (mainly pain and inflammation at the site of the injection). A new vaccine based upon **Vi-rEPA (recombinant Pseudomonas aeruginosa exoprotein A)** has been shown to confer 90% protection for 4 years in 2-5 yrs old children.

About ADI Typhoid ELISA Kits - ADI has developed ELISA kits to determine the efficacy of typhoid vaccines. The use of highly purified Typhi-VI allows the test to be more specific than similar kits using the whole bacterium. Species or antibody subtypes not listed here can also be provided. ADI ELISA kits are rapid (105 min assay at room temp), sensitive (~ <1 ng/ml IgG or IgM), and quantitative.

Salmonella Typhi Typhoid Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2790

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
S. enterica serovar Typhi (Typhoid) polysaccharide (Vi), 96 tests, quantitative	Human	990-500-HTG	990-510-HTM
	Mouse	990-520-MTG	990-530-MTM
	Rabbit	990-540-RTG	990-550-RTM
	Monkey	990-560-HTG	

Related Items

Catalog#	Product Description
990-500-01N	Human Anti-S. enterica serovar Typhi (Typhoid) polysaccharide (Vi) IgG negative control serum for ELISA
990-500-02P	Human Anti-S. enterica serovar Typhi (Typhoid) polysaccharide (Vi) IgG positive control serum for ELISA
990-510-01N	Human Anti-S. enterica serovar Typhi (Typhoid) polysaccharide (Vi) IgM negative control serum for ELISA
990-510-02P	Human Anti-S. enterica serovar Typhi (Typhoid) polysaccharide (Vi) IgM positive control serum for ELISA

Salmonella-Typhi-Typhoid-Vaccine-ELISA-Flr Rev. 160609A

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:

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)

DTP (diphtheria-tetanus-pertussis vaccine)

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)

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)

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)

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?

Identify and measure the vaccines formulated in gels with VacciGel™ ELISAs

VacciGel™ Direct ELISA Features

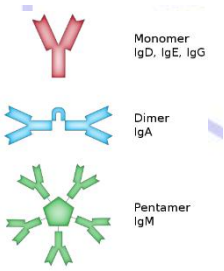
- Direct testing of vaccines formulated in Aluminum gels (Alhydrogel, Adjuphos or Alum)
- High sensitivity ELISA allow testing at 1:100-1:500 diluted vaccines
- No complicated protocol, instruments or extraction procedure that may destroy the vaccines
- Room temp assay in < 2 hrs. Stability ~12 months
- Sensitivity (1-5 ng of vaccine components)
- 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
- **All kits are quantitative and supplied in 50 tests/pk.**

This kit for in vitro research use only.

Vaccine antigens	Catalog#	Product Description
Diphtheria Toxin/toxoid	VAC-DTX-50	VacciGel Direct ELISA for the measurement of Diphtheria Toxoid in Vaccines formulated in Alum
HbSAg	VAC-HBS-50	VacciGel Direct ELISA for the measurement of Hepatitis B Vaccine (HBsAg) formulated in Alum
Human HCG	VAC-HCG-50	VacciGel Direct ELISA for the measurement of HCG (contamination) in Vaccines formulated in Alum
Anthrax PA83	VAC-P83-50	VacciGel Anthrax Protective Antigen 83 (PA83) Protein Adsorbed on Alum, ELISA kit for 50 tests
B. Pertussis Toxin/toxoid	VAC-PTX-50	VacciGel Direct ELISA for the measurement of Pertussis Toxoid in Vaccines formulated in Alum
Tetanus	VAC-TTX-50	VacciGel Direct ELISA for the measurement of Tetanus Toxoid in Vaccines formulated in Alum

Vaccigel_Direct_ELISA_Flr 160611A

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. 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 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 sub isotypes 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.

About ADI's Vaccine Model Antigen ELISA Kits - 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. Model antigen, conjugate, and antibodies are also available for research.

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=2449

ELISA type	Antibody Type	Mouse Cat#	Rat Cat#	Monkey Cat#	Rabbit Cat#	Human Cat#
Ovalbumin (OVA/Gal d 2) 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				670-140-OVG
	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			670-145-OVM
	IgE	600-165-OGE	610-110-OGE			670-150-OVE
Ovalbumin Antigen ELISA kits		6010, Chicken Egg Ovalbumin (Gal d 2) ELISA Kit, 96 tests, Quantitative				
		6050, Chicken Egg Ovalbumin (Gal d 2) ELISA Kit, 96 tests, Quantitative				
		6050-RDT-50, TruStrip RDT Chicken Egg Ovalbumin (Ova/Gal d 2) Rapid Test cards				
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				
	IgG	5120	650-130-DDN	670-100-DNM		3100
	IgG1	5120-1				
	IgG2a	5120-2a				
	IgG2b	5120-2b				
	IgG3	5120-3				
	IgA	5120-A				3110
	IgM	5130		670-105-DNM		3105
	IgE	5120-E				
Anti-**ssDNA** Antibody ELISA	Ig's (G+A+M)	5310				
	IgG	5320	650-330-DSN	650-340-DSN		3115
	IgM	5330				

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

Items	Catalog#	Product Description	Product Type
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

Vaccine or Bioprocess Contaminants 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 (Harvix, 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 Fetal Calf serum (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)	

About ADI's Host Cell Proteins (HCP) ELISA Kits - 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	**Quantitative Ovalbumin ELISA** Kit for vaccines made in chick embryo	6050
	Chicken Egg Ovalbumin ELISA Kit (for high concentration 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 samples containing high concentration of BSA such as FBS)	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 IgG in vaccine grown in bovine serum	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

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.

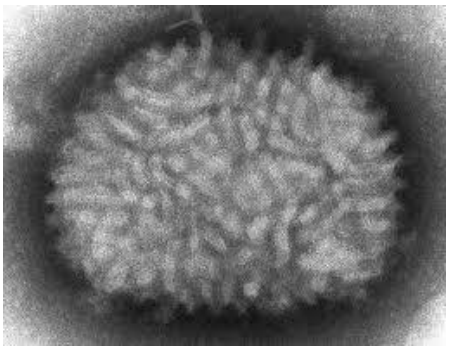
Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgG Cat#	Antibody Type IgM Cat#
E. coli proteins/contaminants **antibody** ELISA	Mouse	500-100-ECP		
	Human	500-110-ECP	500-115-ECP	
	Rabbit	500-120-ECP		
Bovine Serum Albumin (**BSA**) **antibody** ELISA	Goat		710-100-BSG	
	Rabbit		710-110-BSR	
	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		
	Human	800-185-BFH		

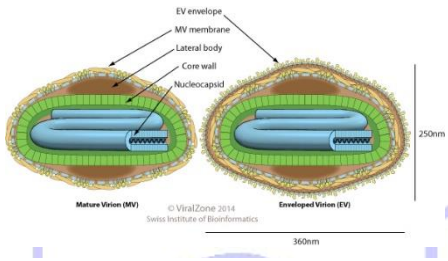
Antibodies & Kits to remove small scale bioprocess contaminants

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	Cat#	Product Description	Type
Albumin	700-300-10	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)	Kit
	800-200-BSA	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	Kit
	800-302-BSA	Bovine serum albumin (BSA) removal kit (**Antibody based** aff matrix; sufficient to remove 1-2 mg BSA from Bioprocessed material), 2 ml aff column	Kit
	BSA15-AS	Bovine Serum albumin-agarose (aff matrix)	Aff support
Fetuins	FETA13-M	Monoclonal Anti-Human Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) IgG	Antibodies
	FETA14-M	Monoclonal Anti-Mouse Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) IgG	Antibodies
	FETA15-A	Anti-Human Serum Fetuin (Alpha-2 HS-Glycoprotein, AHSG, A2HS) IgG	Antibodies
	FETA25-N-1	Purified human serum Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) protein	Pure protein
	FETB11-S	Anti-Bovine Fetuin (Alpha-2 HS-Glycoprotein, AHSG, A2HS) antiserum	Antibodies
	FETB12-A	Anti-Human recombinant Fetuin A (Alpha-2 HS-Glycoprotein, AHSG, A2HS) IgG	Antibodies
	FETB15-N-1	Bovine Fetuin (Alpha-2 HS-Glycoprotein, AHSG, A2HS), BSE-TSE free (New Zealand Origin), Low endotoxin	Pure Protein
	FETB16-N-1	Bovine Fetuin (Alpha-2 HS-Glycoprotein, AHSG, A2HS), BSE-TSE free (Australian Origin), Low endotoxin	Pure Protein
	CAF11-S	Chicken Allantoic fluid (SPF eggs) tested –ve for various chicken viruses, Salmonella and Mycoplasma (suitable for chicken virus ELISA kits)	Kit
	OVA11-AS	Rabbit 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
	OVA15-AS	Chicken Egg Ovalbumin-agarose (aff matrix) to remove anti-ovalbumin Ig's from samples/antisera	Aff support
	OVA15-N-1000	Chicken egg ovalbumin protein (ELISA, antigen, allergy grade)	Rec. Protein
FBS	FBS11-A	Rabbit Anti-Fetal Bovine Serum (FBS) protein IgG	Kit
	FBS12-AS	Rabbit Anti-Fetal Bovine Serum (FBS) protein IgG-Agarose affinity matric to remove fetal bovine serum	kit

Vaccinia Virus (VACV) 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. 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. 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. 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.

It has a linear, dsDNA (190 kb) which encodes for ~250 genes. It is enveloped, brick-shaped or ovoid virion, 220-450 nm long and 140-260 nm wide. The surface membrane displays surface tubules or surface filaments. Two distinct infectious virus particles exists: the intracellular mature virus (**IMV**) and the extracellular enveloped virus (**EEV**). Attachment of the viral proteins to host glycosaminoglycans (GAGs) mediates endocytosis of the virus into the host cell. Assembly of progeny virions starts in cytoplasmic viral factories, producing an spherical immature particle. This virus particle matures into brick-shaped intracellular mature virion (IMV). IMV virion can be released upon cell lysis, or can acquire a second double membrane from trans-Golgi and bud as external enveloped virion (EEV).

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.

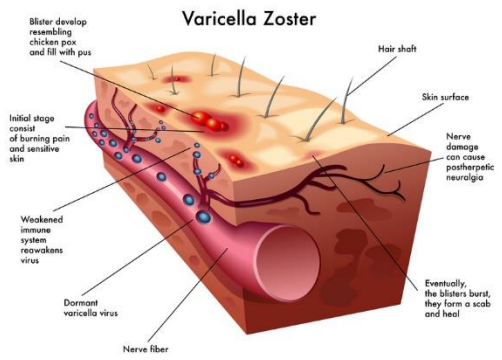
Vaccinia A vaccine Antibodies

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

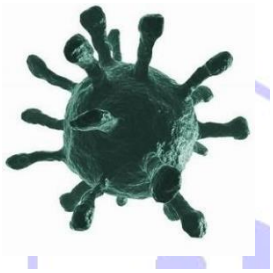
Item	Catalog#	Product Description	Product Type
Vaccinia virus Antibodies	VXV11-BTN	Anti-Vaccinia Virus IgG-Biotin conjugate	antibodies
	VXV11-FITC	Anti-Vaccinia Virus IgG-FITC conjugate	antibodies
	VXV11-HRP	Anti-Vaccinia Virus IgG-HRP conjugate	antibodies
	VXV11-S	Anti-Vaccinia virus (lister) antiserum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

Vaccinia_Vaccine_Flr Rev. 160619A

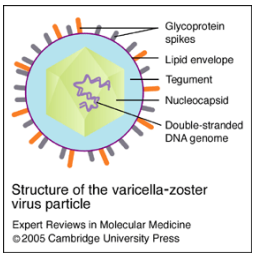
Varicella Zoster Virus Vaccines (VZV) Antibody ELISA Kits, Recombinant Proteins, and Antibodies



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. 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.



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.



Structure of the varicella-zoster virus particle
Expert Reviews in Molecular Medicine
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VZV Vaccines: A live attenuated VZV Oka/Merck strain vaccine is available and is marketed as **Varivax** 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 (124 kb). The ELISA test detects VZV-specific IgM antibody in blood; this appears only during chickenpox or herpes zoster and not while the virus is dormant.

About ADI's VZ Vaccine ELISA - ADI has developed antibody ELISA kits to determine the efficacy of VZV vaccines or test new vaccines. The kits can also be used to assess the immune status of humans or animals. Antibody ELISA kits for species or subtypes not listed here can also be provided. Recombinant VZV antigens and antibodies are also available.

Varicella Zoster Virus vaccine Related ELISA kits

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

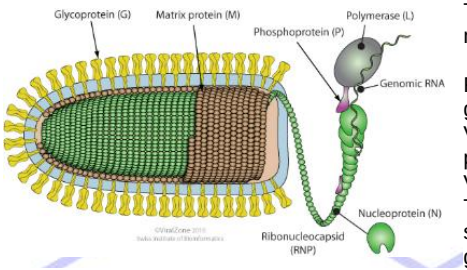
ELISA Kit Description	Species	IgG Specific Cat#	IgM Specific Cat#	IgA Specific Cat#
Varicella Zoster Virus (**VZV) Vaccine** Antibody (chickenpox) ELISA Kits	Human	520-200-HVG	520-210-HVM	520-220-HVA
	Mouse	520-230-HVG	520-240-HVM	520-250-MVA
	Monkey	520-260-BVG	520-270-BVM	520-280-VVA

Catalog#	Product Description	Product Type
520-200-01N	Human Anti-VZV IgG negative control serum/plasma (	Serum Controls
520-200-20M	Human Anti-VZV IgG low positive controlserum/plasma (10-30 u/ml)	Serum Controls
520-200-30H	Human Anti-VZV IgG high positive control serum/plasma (>150 u/ml)	Serum Controls
RP-1453	Recomb. (E. Coli) VZV gE (immunnodominant regions 48-153 aa) protein/antigen	Pure protein
RP-1454	Recomb. (E. Coli) VZV ORF9 (immunodominant regions, 6-28, 76-100 aa) protein/antigen	Pure protein
RP-1455	Recomb. (E. Coli) VZV ORF26 (immunnodominant regions 9-33, 184-208aa) protein/antigen	Pure protein
VZV11-M	Monoclonal VZV antigens IgG (pan, recognizes several VZV proteins)	Antibodies
VZV12-M	Monoclonal Varicella Zoster Virus (VZV/chickenpox) nucleocapsid (155 kda protein) IgG	Antibodies
VZV13-M	Monoclonal Varicella Zoster Virus (VZV/chickenpox) early gene 62 (175 kda) protein) IgG	Antibodies
VZV14-M	Monoclonal Varicella Zoster Virus gp1/IV (VZV/chickenpox) glycoprotein I/IV protein) IgG	Antibodies
VZV15-N-500	Varicella Zoster Virus (VZV/chickenpox) antigens/proteins (VZ-10/MRC-5 cells)	Antigens/proteins
VZV16-N-500	Varicella Zoster Virus (VZV/chickenpox) antigens/proteins (Ellen/HF cells)	Antigens/proteins

Varicella_Zoster_Vaccine_Flr Rev. 160614A

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

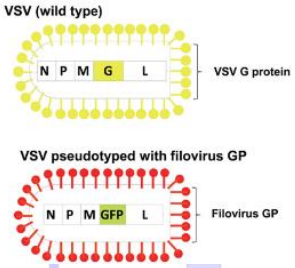
Vesicular stomatitis is a viral disease caused by two distinct serotypes of **vesicular stomatitis virus (VSV) —New Jersey (VSNJV) and Indiana (VSIV)**. Vesiculation, ulceration, and erosion of the oral and nasal mucosa and epithelial surface of the tongue, coronary bands, and teats are typically seen 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.

About 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-VSV Vaccine/Vector ELISA kits

Product details, data sheets, and pricing available (http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2817)

ELISA **Type**	Ab type	Mouse	Human	Monkey
VSV Indiana **Matrix (**VSV-I **M)** Antibody ELISA Kits, **Quantitative**	IgG	AE-327200-1	AE-327210-1	AE-327220-1
VSV Indiana Glycoprotein **(**VSV-I G**)** Antibody ELISA Kits, **Quantitative**	IgG	AE-327300-1	AE-327310-1	AE-327320-1
AD5 (Adenovirus hexon 5 vectors based) Vaccines, 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.

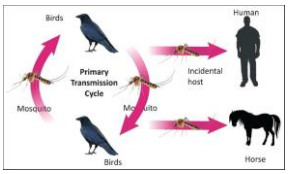
Vesicular Stomatitis Virus (VSV) Vaccine-Recombinant Proteins, and Antibodies

Product details, data sheets, and pricing available (http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2817)

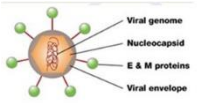
Catalog#	Product Description	Product Type
AE-327210-01N	Human Anti-Vesicular Stomatitis Virus Matrix Protein, Indiana, (VSV-I M) IgG Negative Serum	Disease Sera, VSV
AE-327210-02P	Human Anti-Vesicular Stomatitis Virus Matrix Protein, Indiana, (VSV-I M) IgG positive Serum	Disease Sera
AE-327220-01N	Monkey 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

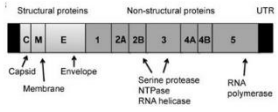
VSV-Vaccines-ELISA-Flr 160610A

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 found in temperate and tropical regions of the world. It was first identified in the **West Nile subregion** in 1937. WNV is now considered to be an endemic pathogen in Africa, Asia, Australia, the Middle East, Europe and in the United States. 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.





The genetic material of WNV is a positive-sense, ssRNA (11-12Kb); thse genes encodes 7 nonstructural proteins (**NS1-5**) and three structural proteins (**C, M, E**). 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. WNV infections produces antibodies to both SPs and NSPs of WNV. Preliminary **diagnosis** is often based on the patient's clinical symptoms, places and dates of travel, activities, and epidemiologic history of the location where infection occurred.
Definitive diagnosis of WNV is obtained through detection of WNV-specific antibodies (IgM/IgG) by ELISA and PCR.

WNV Vaccine: Currently, **no vaccine** against WNV infection is available for humans. There are some vaccines available for veterinary use. 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 is an attenuated **WNV-flavivirus chimera vaccine (WN-FV)** (PreveNile; Intervet) for horses. The vaccine expresses the **E and prM proteins** of WNV in a yellow fever vector (YF17D). **DIVA Tests**: The presence NS1 antibodies may serve to distinguish vaccinated from naturally infected animals or humans.

About ADI's WNV ELISA Kits - ADI has developed WNV antibody (prM, NS1 and Env) ELISA kits to determine the efficacy of WNV vaccines and to screen birds, animals or humans for WNV infections (NS1 antibody). Recombinant proteins and antibodies to WNV are also available to facilitate research on WNV vaccine. ADI ELISA kits are rapid (105 min assay at room temp), sensitive (~ <1 ng/ml IgG or IgM), and quantitative. The use of highly purified recombinant proteins also allows the test to be more specific for WNV than similar kits using the whole viral proteins.

West Nile Virus Related ELISA kits

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

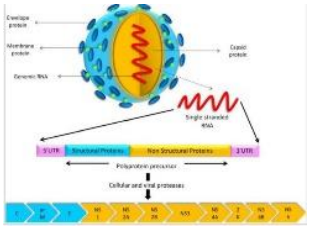
Vaccines	Target Antigens	ELISA Type	Ab Type	Human	Mouse	Monkey	Others
West Nile Virus (WNV)	Whole viral antigens	Ab	IgG	910-300-WNG	910-200-WNG	910-400-WNG	910-570-WNG (bird)
			IgM	910-305-WNM	910-205-WNM	910-405-WNM	910-505-WNM (bird)
	prM	Ab	IgG	910-370-WNG	910-270-WNG	910-470-WNG	910-570-WNG (bird)
			IgM	910-375-WNM	910-275-WNM	910-475-WNM	910-575-WNM (bird)
	Envelop	Ab	IgG	910-380-WNG	910-280-WNG	910-480-WNG	910-580-WNG (bird)
			IgM	910-385-WNM	910-285-WNM	910-485-WNM	910-585-WNM (bird)
	NS1	Ab	IgG	910-390-WNG	910-290-WNG	910-490-WNG	910-590-WNG (bird)
			IgM	910-395-WNM	910-295-WNM	910-495-WNM	910-595-WNM (bird)

West Nile Virus Recombinant Proteins & Antibodies

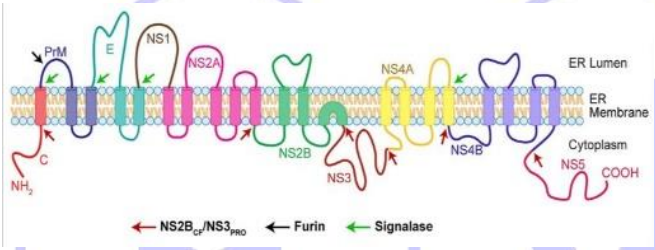
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2777

	Catalog#	Product Description	Product Type
WNV Vaccine	WNV11-S	Rabbit Anti-WNV vaccine (innovator) antiserum	Antiserum
	WNV12-S	Rabbit Anti-WNV vaccine/Innovator, inactivated) antiserum	Antiserum
	WNV13-S	Rabbit Anti-WNV, Recombitek/DNA vaccine) antiserum	Antiserum
WNV-Env	WNV11-M	Monoclonal anti-WNV envelop protein IgG (non-reactive with Dengue, SLE, JEV)	Antibodies
	WNV12-M	Monoclonal anti-WNV envelop protein IgG #2 (crossreacts with Dengue, SLE, JEV)	Antibodies
	WNV15-S	Rabbit Anti-WNV chimeric protein (C+prM+E) antiserum	Antibodies
	WNV16-S	Rabbit Anti-WNV envelop protein antiserum	Antiserum
	WNVE19-S	Rabbit Anti-WNV Env-DIII protein antiserum	Antiserum
	WNVE15-R-50	Recomb. (E. coli) WNV-Env protein (>95%, ~42 Kda, His-tag)	Rec. Protein
	WNVE16-R-50	Recomb. (HEK) WNV-E, domain III protein (>95%, ~12 Kda, His-tag)	Rec. Protein
	WNVE17-R-50	Recomb. (yeast) WNV-E, domain III, lineage 2) protein (>95%, ~12 Kda, His-tag)	Rec. Protein
WNV-prM	WNV18-S	Rabbit Anti-WNV prm protein antiserum	Antiserum
	WNVP21-S	Rabbit Anti-WNV prM antiserum	Antiserum
	WNVP18-R-50	Recomb. (E. coli) WNV prM protein (>95%, ~20 Kda, His-tag)	Rec. Protein
WNV-NS1	WNV17-S	Rabbit Anti-WNV NS1 (WNV-NS1, US strain) protein antiserum	Antiserum
	WNVN20-M	Mouse Monoclonal Anti-WNV NS1 (WNV-NS1) IgG	Antibodies
	WNV15-R-10	Recombinant (E. coli) WNV chimeric protein (Capsid+prM+Env, ~70 Kda, His-tag)	Rec. Protein
	WNVNS17-R-10	Recombinant (E. coli) WNV NS1 protein (USA, >95%, ~41 Kda, His-tag)	Rec. Protein
	WNVNS21-R-50	Recombinant (HEK) WNV NS1 protein (>95%, ~50 Kda, His-tag)	Rec. Protein

Yellow Fever Virus (YFV) Vaccines: ELISA Kits, Recombinant Proteins, and Antibodies



Yellow fever is a viral hemorrhagic disease spread between humans, as well as between certain other primates and humans, by the bite of yellow fever-infected mosquitoes. In cities, it is spread primarily by mosquitoes of the *Aedes aegypti* species. The virus is called simply **Yellow fever virus (YFV)** and belongs to the virus family Flaviviridae. Humans are a dead-end host, terminating the virus's life cycle and consequently suffering from much harsh symptoms than its native host. Yellow fever is a serious, potentially deadly flu-like disease spread by mosquitoes. It's characterized by a high fever and jaundice. Jaundice is yellowing of the skin and eyes, which is why this disease is called yellow fever. This disease is most prevalent in tropical and subtropical areas in South America and Africa. Yellow fever can't be passed directly from person to person through close contact. According to the recent analysis, there are an estimated 84 000–170 000 cases and up to 60 000 deaths due to yellow fever per year.



Yellow Fever Virus (YFV) is a positive-sense, ssRNA, (11 kb) encoding three structural (**C, prM, E**) and seven nonstructural proteins (**NS1**, NS2A, NS2B, NS3, NS4A, NS4B, NS5). Env/E protein is the major inducer and target of virus neutralizing antibodies. The function of the virus E proteins is to attach the virus to receptors on host cells; they initiate the biggest immune response from the host. The M proteins appear to keep the E proteins functional during the assembly of new viruses. C proteins are found in the virus nucleocapsid.

Diagnosis of yellow fever is often based on the patient's clinical features, places and dates of, activities, and epidemiologic history of the location where the presumed infection occurred. Initial **serological testing** is performed by the detection of YFV-IgM and IgG antibodies by **ELISA**. There is no specific treatment for yellow fever.

Yellow Fever vaccine: YFV vaccine came into use in 1938. It is on the WHO's List of Essential Medicines. **YF-VAX®**, Yellow Fever Vaccine, for subcutaneous use, is prepared by culturing the 17D-204 8 strain of yellow fever virus in chicken embryos. YFV vaccination provides life-long immunity. The yellow fever 17D vaccine is considered very safe with over 500 million doses given and very few documented cases of vaccine associated illness. As a result of the effectiveness of the yellow fever vaccine 17D, chimeric variants of YFV are being used to produce vaccines against other arbovirus diseases such as dengue fever (**DENV**), West Nile (**WNV**), and Japanese encephalitis (**JEV**).

A new technology, called **ChimeriVax** has been developed to excise the specific genes that encode the **E and prM proteins of the YFV** and replace it with the gene for the E and prM protein of the target virus such as DENV. Recombinant virus is grown in a cell culture and use for dengue or other virus vaccines.

About ADI's YFV Vaccine ELISA Kits - ADI has produced YFV recombinant proteins (Env, prM and NS1) and developed ELISA kits to determine the efficacy of YFV vaccines or YFV-Chimeric vaccines. The use of highly purified recombinant proteins also allows the test to be more specific for YFV than similar kits using the whole viral proteins. ADI ELISA kits are rapid (105 min assay at room temp), sensitive (~ <1 ng/ml IgG or IgM), and quantitative.

YFV Related ELISA kits

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2940

Items Description	Species	Antibody Type IgG Cat#	Antibody Type IgM Cat#
YFV Envelop Protein Antibody ELISA kit, 96 tests, quantitative	Human	530-200-EHG	530-205-EHM
	Mouse	530-220-EMG	530-225-EMM
YFV NS1 Antibody ELISA kits, 96 tests, quantitative	Human	530-300-NHG	530-305-NHM
	Mouse	530-320-NMG	530-325-NMM

YFV Recombinant Proteins & Antibodies

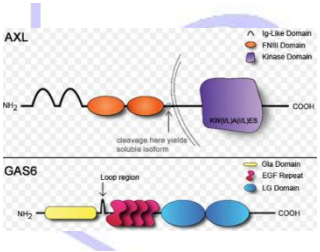
(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2940

Catalog#	Product Description	Product Type
YFVEN16-C	Recomb. (E. coli) YFV Env protein (YFV-Env/17D) Western blot +ve control	Western control
YFVEN16-R-10	Recomb. (E. coli) YFV Env protein (YFV-Env/17D, full EC domain 445aa) (>95%, his-tag)	Recomb. Protein
YFVEN16-S	Anti-Yellow Fever Virus Env protein (YFV-Env/17D) antiserum	Antiserum
YFVNS15-C	Recomb. YFV NS1 protein (YFV-NS1/17D, 779-1136aa) control for western blot	Western control
YFVNS15-R-10	Recomb. (HEK) YFV NS1 protein (YFV-NS1/17D, 779-1136aa) (>95%, his-tag)	Recomb. Protein
YFVNS15-S	Anti- YFV NS1 protein (YFV-NS1/17D, 779-1136aa) antiserum	Antiserum
YFVPR17-R-10	YFV prM protein (YFV-Env/17D, 89-aa prM) (>95%, No-tag)	Recomb. Protein
YFVPR17-S	Anti- YFV prM Env protein (YFV-Env/17D, 89-aa prM) antiserum	Antiserum
YFVEN16-C	Recomb. (E. coli) YFV Env protein (YFV-Env/17D) Western blot +ve control	Western control
YFVEN16-R-10	Recomb. (E. coli) YFV Env protein (YFV-Env/17D, full extracellular domain 445aa) (>95%, his-tag)	Recomb. Protein
YFVEN16-S	Anti-Yellow Fever Virus Env protein (YFV-Env/17D) antiserum	Antiserum
YFVNS15-C	Recomb,. YFV NS1 protein (YFV-NS1/17D, 779-1136aa) control for western blot	Western control

Yellow-Fever-Vaccine-ELISA-Flr Rev. 160618

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. 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.

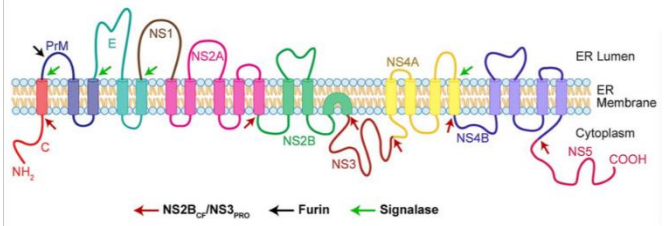
Zika virus (ZIKV) is a member of the virus family Flaviviridae and the genus Flavivirus (*flavus* means yellow), transmitted by daytime-active Aedes mosquitoes, such as A. aegypti and A. albopictus. Zika virus is related to the dengue, yellow fever, Japanese encephalitis, and West Nile viruses. Like 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**.



Axl (from the Greek word anexelekto, or uncontrolled), is a receptor tyrosine kinase with a structure novel among tyrosine kinases. Axl is also known as Tyrosine-protein kinase receptor **UFO** (unidentified function of this protein). Axl protein represents a unique structure of the extracellular region that juxtaposes IgL and FNIII repeats. It transduces signals from the extracellular matrix into the cytoplasm by binding growth factors like vitamin K-dependent protein **growth-arrest-specific gene 6 (GAS6;** human 721-aa, mouse 674-aa**).** Gas6 is a gamma-carboxyglutamic acid (Gla) domain-containing protein thought to be involved in the stimulation of cell proliferation. This receptor can also mediate cell aggregation by homophilic binding. The Axl gene is evolutionarily conserved between vertebrate species AXL (human 894-aa; 1-451-aa Extracellular domain) is highly expressed by human radial glial cells, astrocytes, endothelial cells, and microglia in developing human cortex and by progenitor cells in developing retina Expression analyses suggest that AXl may serve as a receptor for Zika virus. Recombinant Axl proteins (human and mouse) as well as monoclonal and polyclonal anti-Axl antibodies are available to understand the importance of Axl association with Zika infection.

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

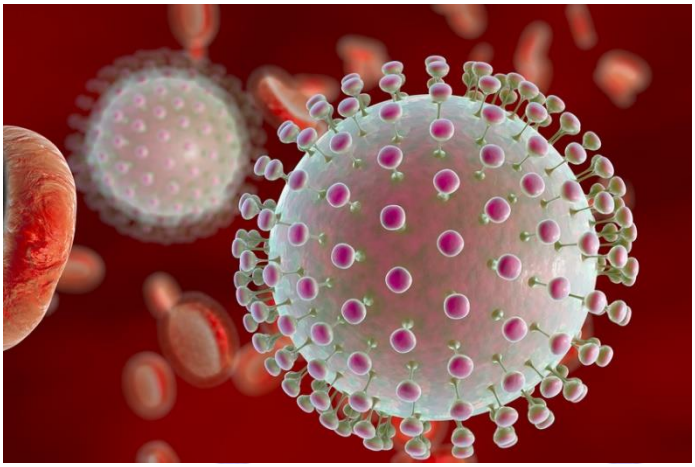
Diagnosis - Unlike other flaviviruses, not much is commercially available for Zika virus's recombinant proteins, antibodies, and diagnostic ELISA kits. For now, diagnosis confirmed by detecting the viral DNA by PCR. During the **Ebola and MERS** emergence in 2014, ADI was the first company to develop 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, ~11kb). Zika virus genome codes for a polyprotein that is subsequently cleaved into capsid (**C**), precursor membrane (**prM**), envelope (**E**), and non-structural proteins (**NS**1-5). 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. 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.

About ADI's Zika Virus ELISA Kits *– ADI has 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.*

Zika Virus ELISA Kits, Recombinant proteins and Antibodies



Flaviviruses are known to induce antibodies to several **structural** (**Envelop, prM, and capsid**) and **non-structural** proteins (**NS1**). 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 etiology and utility of the Zika virus antibodies. ADI is making available a number of ELISA kits to help understand the Zika virus infection and test available vaccines or therapeutic interventions.

Zika Virus Vaccine Related ELISA kits (See Details at the website)

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2880

Product Description	Species	IgG cat #	IgG1 cat #	IgG2 cat #	IgM cat #
RecombiVirus™ Zika Virus **Envelop antibody** ELISA kits, Quantitative, 96 tests	Human	RV-403100	RV-403100-HG1	RV-403100-HG2	RV-403105
	Monkey	RV-403110			
	Mouse	RV-403120	RV-403120-MG1	RV-403120-MG2A	RV-403125
	Rabbit	RV-403130			
RecombiVirus™ Zika Virus **Envelop Domain III** ELISA kits, Quantitative, 96 tests	Human	RV-403150	RV-403150-HG1	RV-403150-HG2	RV-403155
	Monkey	RV-403160			RV-403165
	Mouse	RV-403170	RV-403170-MG1	RV-403170-MG2A	RV-403175
	Rabbit	RV-403180			RV-403185
RecombiVirus™ Zika Virus **PrM antibody** ELISA kits, Quantitative, 96 tests	Human	RV-403200	RV-403200-HG1	RV-403200-HG2	RV-403205
	Monkey	RV-403210			RV-403215
	Mouse	RV-403220	RV-403220-MG1	RV-403220-MG2A	RV-403225
	Rabbit	RV-403230			RV-403235
RecombiVirus™ Zika Virus **NS1 antibody** ELISA kits, Quantitative, 96 tests	Human	RV-403300	RV-403300-HG1	RV-403300-HG2	RV-403305
	Monkey	RV-403310			RV-403315
	Mouse	RV-403320	RV-403320-MG1	RV-403320-MG2A	RV-403325
	Rabbit	RV-403330			RV-403335
RecombiVirus™ Zika Virus **Capsid antibody** ELISA kits, Quantitative, 96 tests	Human	RV-403400	RV-403400-HG1	RV-403400-HG2	RV-403405
	Monkey	RV-403410			RV-403415
	Mouse	RV-403420	RV-403420-MG1	RV-403420-MG2A	RV-403425
	Rabbit	RV-403430			RV-403435

****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

(See Details at the website) http://4adi.com/commerce/catalog/spcategory.jsp?category_id=2880

Type	Catalog#	Product Description	Product Type
Zika Env	ZENV15-R-10	Recomb. (**E. coli**) Zika Virus Envelop Protein (African, full length, >95%, his tag) for ELISA/Western	Rec. protein
	ZENV16-R-10	Recomb. (Sf9) Zika Virus Envelop Protein (African, full length, ~50 Kda, >95%, his tag) for ELISA	Rec. protein
	ZENV17-R-10	Recomb. (HEK) Zika Virus Envelop Protein domain III (Brazil, ~13 kda >95%, his tag, low endotoxin) for ELISA	Rec. protein
	ZENV11-S	Rabbit Anti-Zika Virus Envelop Protein (African) antiserum	Antibodies
	ZENV11-C	Recomb. (**E. coli**) Zika Virus Envelop Protein (African, control for Western	Western control
	ZENV12-M	Mouse Monoclonal Anti-Zika Virus Envelope Protein (African) IgG #1	Antibodies
	ZENV12-BTN	Mouse Monoclonal Anti-Zika Virus Envelope Protein (African) IgG #1-Biotinylated	Antibodies
	ZENV13-M	Mouse Monoclonal Anti-Zika Envelope Protein (African) IgG #2	Antibodies
	ZENV13-BTN	Mouse Monoclonal Anti-Zika Envelope Protein (African) IgG #2-Biotinylated	Antibodies
Zika Eng (domain III)	ZEND19-BTN	Recomb. (**HEK**) Zika Envelop Protein domain III-Biotinylated (Brazil, ~13 kda >95%, his tag, low endotoxin) for ELISA	Rec. protein
	ZEND20-A	Rabbit Anti-Zika Envelop DIII IgG, pure	Antibodies
	ZEND20-BTN	Rabbit Anti-Zika Envelop DIII IgG-biotinylated	Antibodies
	ZEND21-M	Mouse Monoclonal Anti-Zika Envelop DIII IgG, pure	Antibodies
	ZEND21-BTN	Mouse Monoclonal Anti-Zika Envelop DIII IgG-biotinylated	Antibodies
Zika prM	ZPRM15-R-10	Zika Virus prM Protein (African, >95%, synthetic, no tag) for ELISA/Western	Rec. protein
	ZPRM11-S	Rabbit Anti-Zika Virus prM Protein (African, >95%) antiserum	Antibodies
	ZPRM11-C	Zika Virus prM Protein (African) control for Western blot	Western control
Zika Capsid	ZCAP17-P	Zika Virus Capsid immunodominant region (African, >95%, no tag) for ELISA	Peptides
	ZCAP17-S	Rabbit Anti-Zika Virus Capsid immunodominant peptide (African) antiserum	Antibodies
Zika NS1	ZNS115-R-10	Recomb. (**E. coli**) Zika NS1 Protein (African, full length, >95%, his tag) for ELISA/Western	Rec. protein
	ZNS117-R-10	Recomb. (**sf9**) Zika NS1 Protein (African, full length, >95%, his tag) for ELISA	Rec. protein
	ZNS117-R-BTN	Recomb. (**sf9**) Zika Virus NS1 Protein-Biotinylated (African, full length, >95%, his tag) for ELISA	Rec. protein
	ZNS118-R-10	Recomb. (**HEK**) Zika Virus NS1 Protein (Brazil, full length, >95%, his tag) for ELISA/Western	Rec. protein
	ZNS118-R-BTN	Recomb. (**HEK**) Zika Virus NS1 Protein-Biotinylated (Brazil, full length, >95%, his tag) for ELISA/Western	Rec. protein
	ZNS111-S	Rabbit Anti-Zika Virus (E. coli) NS1 Protein (African) antiserum	Antibodies
	ZNS111-C	Recomb. (**E. coli**) Zika Virus NS1 Protein control for Western blot	Western control
	ZNS112-M	Mouse Monoclonal Anti-Zika Virus NS1 Protein (African) #1, aff pure	Antibodies
	ZNS112-BTN	Mouse Monoclonal Anti-Zika Virus NS1 Protein (African) #1-Biotinylated	Antibodies
	ZNS113-M	Mouse Monoclonal Anti-Zika Virus NS1 Protein (African) #2, aff pure	Antibodies
	ZNS113-BTN	Mouse Monoclonal Anti-Zika Virus NS1 Protein (African) #2-Biotinylated	Antibodies
AXL (Zika receptor)	AXL15-R-10	Recomb. (HEK) Mouse Axl Protein (1-443aa, >98%, his-tag, low endotoxin)	Rec. protein
	AXL15-R-BTN	Recomb. (HEK) Mouse Axl Protein-Biotinylated (1-443aa, >98%, his-tag, low endotoxin)	Rec. protein
	AXL16-R-10	Recomb. (HEK) Human Axl Protein (1-449aa, >98%, his-tag, low endotoxin)	Rec. protein
	AXL16-R-BTN	Recomb. (HEK) Human Axl Protein -Biotinylated (1-449aa, >98%, his-tag, low endotoxin)	Rec. protein
	AXL11-A	Rabbit Anti-Mouse AXL protein IgG, aff pure	Antibodies
	AXL11-BTN	Rabbit Anti-Mouse AXL protein IgG-Biotinylated	Antibodies
	AXL12-A	Rabbit Anti-Human AXL protein IgG, aff pure	Antibodies
	AXL12-BTN	Rabbit Anti-Human AXL protein IgG-Biotinylated	Antibodies
	AXL13-M	Mouse Monoclonal Anti-Human AXL protein IgG, aff pure	Antibodies
	AXL13-BTN	Mouse Monoclonal Anti-Human AXL protein IgG-Biotinylated	Antibodies
	AB-23085-A	Rabbit Anti-Human AXL (phosphoY821) IgG (aff pure)	Antibodies
	AB-23085-P	Human AXL (phosphoY821) peptide	Peptide
	AB-23085-CP	Human AXL (non-phospho) control peptide	Peptide
GAS6	GAS65-R-10	Recomb. (HEK) Mouse GAS6 protein (1-674aa, >95%, his-tag)	Rec. protein
	GAS65-R-BTN	Recomb. (HEK) Mouse GAS6 Protein-Biotinylated (1-674aa, >95%, his-tag)	Rec. protein

ADI also have recombinant proteins ELISA kits for West Nile Virus, Dengue Viruses, Japanese Encephalitis Virus (JEV),
Zika_Vaccines_ELISA_Flr 160612A

List of International Distributors

Please see updated and list at the website (www.4adi.com).

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