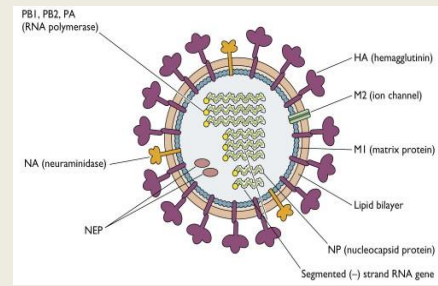


Influenza A virus causes influenza in birds and some mammals, and is the only species of influenza virus A. Occasionally, viruses are transmitted from wild aquatic birds to domestic poultry, and this may cause an outbreak or give rise to human influenza pandemics. The physical structure of all influenza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

The '**Annual flu**' (seasonal flu) in the U.S. results in approximately 36,000 deaths and more than 200,000 hospitalizations each year. In addition to this human toll, influenza is annually responsible for a total cost of over \$10 billion in the U.S. The influenza virus constantly mutates, forcing scientists to play catch-up and produce a new seasonal vaccine each year. The influenza vaccination, also known as a **flu shot**, is an annual vaccination using a vaccine specific for a given year to protect against the highly variable influenza virus. The influenza **M2 protein** is observed to remain relatively constant over multiple cycles of mutations in the flu virus. Thus the 23 amino acid ectodomain of M2 is considered as a good candidate to make a



“universal vaccine”. In 2008 Acambis announced work on a universal flu vaccine (**ACAM-FLU-A™**) based on three M2e

domains presented on HepB core antigen. The Phase I trials for **ACAM-FLU-A™** showed that the vaccine was well-tolerated and when delivered in combination with the QS-21 Stimulon® adjuvant induced an immunogenic response in 90% of the subjects. Dynavax Technologies Corporation has developed a **vaccine N8295** based on two highly conserved antigens NP and M2e and their TLR9 agonist. The pre-clinical phase results for **N8295** show that the vaccine is well tolerated and generates an immunogenic response.

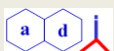
The **VAX102** vaccine by Vaxinnate Corp. is a recombinant fusion protein which contains four tandem copies of the M2e antigen linked to **Salmonella typhimurium flagellin**, using a TLR5 ligand as an adjuvant. The **VAX102** has undergone Phase I clinical trials. The **M2-OMPC** conjugate vaccine by Merck which is currently in Phase I of its clinical trials has been highly effective in inducing an immunogenic response in ferrets, mice and monkeys during its pre-clinical investigations. 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 reassortant (HKxPR8; H3N1) post-immunization.

ADI has developed antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. ADI is further expanding the antibody ELISAs to measure 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=2736

Items Description	Species	Antibody Type IgA Cat#	Antibody Type IgG Cat#	Antibody Type IgM Cat#
Anti-Influenza A virus M2 protein antibodies ELISA kits	Human	920-200-MHA	920-205-MHG	920-210-MHM
	Mouse	920-220-MMA	920-225-MMG	920-230-MMM
	Rabbit	920-240-MRA	920-245-MRG	920-250-MRM
	Chicken		920-320-MCG	920-325-MCM
	Swine/Pig		920-330-MSG	920-335-MSM
	Monkey	920-380-MKA	920-385-MKG	920-390-MKM



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

Cat#	Description	Product Type
AR-232-U	H5 Avian Influenza Virus (HAS15-5), RNA Aptamer, unlabeled	RNA Aptamers
AR-242-U	Human Influenza A virus H3N2 (P30-10-16), RNA Aptamer, unlabeled	RNA Aptamers
H11N2-01-A	Anti-Hemagglutinin HA1 Influenza A Virus (H11N2; A/duck/Yangzhou/906/2002) IgG	Pure protein
H11N2-01-C	Recombinant Purified Hemagglutinin Influenza A Virus (H11N2; A/duck/Yangzhou/906/2002) control	Pure protein
H1N1-01-A	Anti-Hemagglutinin Influenza A Virus H1N1 H1 (H1N1) (A/New Caledonia/20/99) IgG	Pure protein
H1N1-01-C	Recombinant Purified Hemagglutinin Influenza A Virus H1N1 (A/New Caledonia/20/99) protein control	Pure protein
H1N1-01-R-10	Recombinant Purified Hemagglutinin Influenza A Virus H1N1 (A/New Caledonia/20/99) protein	Pure protein
H1N1-02-A	Anti-Hemagglutinin Influenza A Virus H1N1 H1 (Pan H1N1 reacts with multiple strains of H1N1) IgG	Pure protein
H5N11-C	Recom Purified Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa)	Pure protein
H5N11-S	Rabbit Anti-Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa) protein	Antibodies
H5N12-S	Mouse Anti-Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa) protein	Antibodies
H5N15-R-10	Rec. Pure Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa), His-tag	Pure protein
H5N15-R-100	Rec. Purified Hemagglutinin Influenza A Virus H5N1 (A/chicken/India/NIV33487/2006) (17-531aa), His-tag	Pure protein
HIB12-S	Rabbit Anti-Haemophilus influenzae, Type B (heat killed, whole bacteria) antiserum	Antibodies
INFA11-M	Mouse Anti-Influenza A virus IgG, aff pure	Antibodies
MA-20170	Mouse Monoclonal Anti-Human Influenza A virus Nucleoprotein	Antibodies
MA-20171	Mouse Monoclonal Anti-Human Influenza B virus Nucleoprotein	Antibodies
PRPB11-S	Rabbit Anti-Haemophilus influenzae, Type B PRP (Hib-PRP) antiserum	Antibodies
RP-1520	Influenza A Virus (H1N1) Beijing 262/95	Pure protein
RP-1521	Influenza A Virus (H1N1) New Caledonia 20/99 IV 116	Pure protein
RP-1522	Influenza A Virus (H3N2) Shangdong 9/93	Pure protein
RP-1523	Influenza A Virus (H3N2) Kiev 301/94 like /Johannesburg 33/94	Pure protein
RP-1524	Influenza A Virus (H3N2) Panama 2007/99	Pure protein
RP-1525	Influenza A Virus (H1N1) Taiwan 1/86	Pure protein
RP-1526	Influenza B Virus Qingdao 102/91 (purified virus, inactivated)	Virus/inactivated
RP-1527	Influenza B Virus Tokio 53/99 (purified virus, inactivated)	Pure protein
RP-1528	Influenza B Virus Victoria 504/00 (purified 7/6/2011, inactivated)	Pure protein
RP-1591	Influenza B Virus Florida 04/06 (purified virus, inactivated)	Pure protein
RP-1592	Influenza B Virus Malaysia 2506/04 (purified virus, inactivated)	Inactivated Virus
RP-1593	Recombinant Hemagglutinin Influenza B Virus Malaysia 2506/04 (HA full length, insect cells)	Pure protein
RP-638	Recombinant Hemagglutinin Influenza A Virus H1N1 New Caledonia 20/99 (HA full length, Sf9 cells)	Pure protein
RP-639	Recombinant Hemagglutinin Influenza A Virus H1N1 Texas 36/91	Pure protein
RP-640	Recombinant Hemagglutinin Influenza A Virus H7N7 Netherlands 219/03	Pure protein
RP-641	Recombinant Hemagglutinin Influenza A Virus H5N1 Vietnam 1203/04	Pure protein
RP-642	Recombinant Hemagglutinin Influenza A Virus H3N2 New York 55/04 (HA protein full length, Sf9 cells)	Pure protein
RP-643	Recombinant Hemagglutinin Influenza A Virus H3N2 Wyoming 3/03	Pure protein
RP-644	Recombinant Hemagglutinin Influenza A Virus H9N2 Hong Kong 1073/99	Pure protein
RP-645	Recombinant Hemagglutinin Influenza A Virus H1N1 California/04/2009	Pure protein
RP-646	Recombinant Hemagglutinin Influenza B Virus Ohio 01/05 (HA full length, insect cells)	Pure protein
RP-647	Recombinant Hemagglutinin Influenza A Virus H3N2 Wisconsin 67/05	Pure protein
RP-648	Recombinant Hemagglutinin Influenza B Virus Jilin 20/03 (HA full length, insect cells)	Pure protein
SEND21-M	Monoclonal Anti-Parainfluenza virus 3 IgG	Antiserum
SEND22-M	Monoclonal Anti-Parainfluenza virus 2 IgG	Antiserum
SEND23-S	Goat Anti-Sendai (Sev/Parainfluenza virus 2/3) antiserum	Antiserum
SP-53126-5	Influenza HA (307 - 319) (AA: Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr) (MW: 1503.82)	Pure Peptide
SP-56844-5	Influenza HA (518 - 526) (AA: Ile-Tyr-Ser-Thr-Val-Ala-Ser-Ser-Leu) (MW: 940.07)	Pure Peptide
SP-58255-5	Influenza A NP (366 - 374) Strain A/NT/60/68 (AA: Ala-Ser-Asn-Glu-Asn-Met-Asp-Ala-Met) (MW: 982.06)	Pure Peptide
SP-64000-5	Influenza HA (110 - 120) (AA: Ser-Phe-Glu-Arg-Phe-Glu-Ile-Phe-Pro-Lys-Glu) (MW: 1428.62)	Pure Peptide
SP-64021-5	Influenza NP (147 - 155) (AA: Thr-Tyr-Gln-Arg-Thr-Arg-Ala-Leu-Val) (MW: 1107.29)	Pure Peptide
SP-68060-5	Influenza A NP (366 - 374) Strain A/PR/8/35 (AA: Ala-Ser-Asn-Glu-Asn-Met-Glu-Thr-Met) (MW: 1026.12)	Pure Peptide
SP-68061-5	PA (224-233), Influenza (AA: Ser-Ser-Leu-Glu-Asn-Phe-Arg-Ala-Tyr-Val) (MW: 1185.31)	Pure Peptide
SP-83168-5	NS2(114 - 121), Influenza (AA: Arg-Thr-Phe-Ser-Phe-Gln-Leu-Ile) (MW: 1011.20)	Pure Peptide
SP-83170-5	PB1(703 - 711), Influenza (AA: Ser-Ser-Tyr-Arg-Arg-Pro-Val-Gly-Ile) (MW: 1034.19)	Pure Peptide
SP-86614-5	Influenza NP (50 - 57) (AA: Ser-Asp-Tyr-Glu-Gly-Arg-Leu-Ile) (MW: 952.04)	Pure Peptide
SP-86615-5	Influenza NP (482 - 489) (AA: Ser-Asn-Glu-Gly-Ser-Tyr-Phe-Phe) (MW: 949.98)	Pure Peptide
SP-86616-5	Influenza HA (529 - 537) (AA: Ile-Tyr-Ala-Thr-Val-Ala-Gly-Ser-Leu) (MW: 894.04)	Pure Peptide
SP-86617-5	Influenza HA (210 - 219) (AA: Thr-Tyr-Val-Ser-Val-Gly-Thr-Ser-Thr-Leu) (MW: 1027.15)	Pure Peptide
SP-86618-5	Influenza HA (204 - 212) (AA: Leu-Tyr-Gln-Asn-Val-Gly-Thr-Tyr-Val) (MW: 1056.19)	Pure Peptide
SP-86619-5	Influenza HA (110 - 119) (AA: Ser-Phe-Glu-Arg-Phe-Glu-Ile-Phe-Pro-Lys) (MW: 1299.50)	Pure Peptide
SP-86620-5	Influenza A NP (366 - 374) (AA: Ala-Ser-Asn-Glu-Met-Asn-Asp-Ala-Met) (MW: 982.06)	Pure Peptide
SP-86621-1	Influenza A M2 coat protein (22 - 46)	Pure Peptide
SP-88515-1	Hemagglutinin (48-68) / Influenza virus	Pure Peptide

Influenza-A-M2e-Universal-Vaccine-ELISA-Flr.pdf

150318A

