

 **Sino Biological**

Influenza Virus Research Toolkits

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Seasonal flu is a common infectious disease of the respiratory tract caused by influenza virus. There are four types of influenza viruses, influenza type A, B, C, and D. Influenza A and Influenza B are notorious for their seasonalities and high infectious potentials. Throughout modern history, Influenza A viruses have caused several deadly pandemics, including the historic 1918 Spanish flu (H1N1), Asian flu (H2N2), Hong Kong flu (H3N2), and the more recent H1N1 outbreak in 2009, rendering life losses in the millions.

Sino Biological offers recombinant flu antigen products under its ProVir® viral antigen collection. The product line covers Hemagglutinin (HA), Neuraminidase (NA), and Nucleoprotein (NP) proteins, from all WHO-recommended vaccine strains in recent years. These antigens can be used to analyze vaccine-induced antibody response and study antigen diagnostic standard, drug effect and mechanism, etc. In addition, Sino Biological has also developed a large collection of monoclonal antibodies against the flu antigens. The broad-spectrum flu antibodies are appealing due to their ability to bind multiple viral subtypes and potentially compensate for the high mutation rates of influenza viruses. These reagents can help facilitate relevant assay development.

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NA Antigens

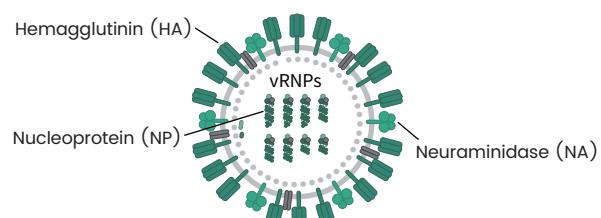
Antibody Pairs for NA Detection

Influenza Virus

The influenza virus is a global threat to human health. It is responsible for annual epidemics across the globe and several pandemics in history. There are four types of influenza viruses: A, B, C, and D. Human influenza A and B viruses cause seasonal epidemics (known as the flu season). Influenza A viruses are the only influenza viruses known to cause flu pandemics.

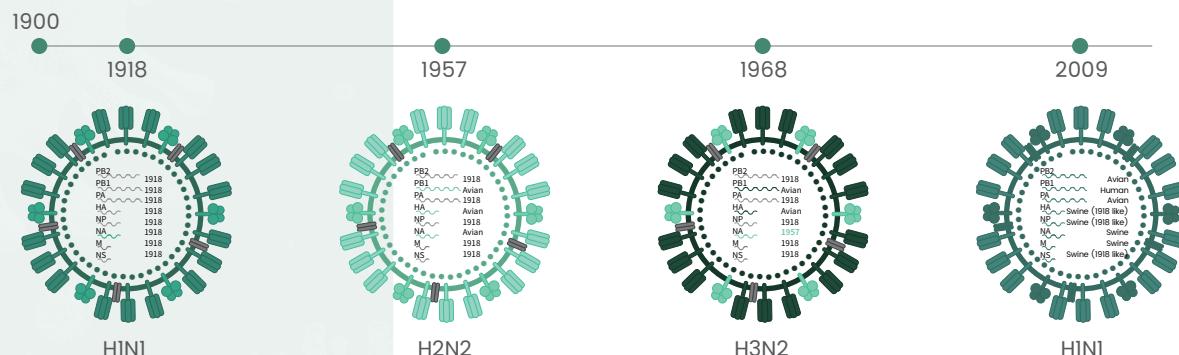
Influenza Virus Antigens:

The influenza virus has an envelope structure. Within the interior of the virus, Nucleoprotein (NP) binds the single-stranded genome segments for RNA transcription, replication, and packaging. The viral envelope is a lipid bilayer membrane. Glycoproteins known as HA (hemagglutinin) and NA (neuraminidase) are essential for the immune response against the virus.



Subtype Classification:

Influenza A viruses are classified by subtypes based on the properties of the HA and NA surface proteins. There are 18 different HA subtypes and 11 different NA subtypes. Subtypes are named by combining the H and N numbers, e.g., A(H1N1).



Seasonal Influenza Vaccine Strains:

Vaccination is the best way to prevent infection. Due to the high mutagenesis rate of influenza viruses by their antigenic drift or shift between the HA and NA proteins, the selection of vaccine strains is updated annually based on the year-round globe surveillance of virus circulation. Three to four flu strains are selected to formulate the seasonal flu vaccine, among which the most abundant H1N1 and H3N2 strains of influenza A and one or two popular strains of influenza B are included in each season.

To support the fight against influenza viruses, Sino Biological has developed a comprehensive panel of influenza research reagents, including recombinant antigen products covering all WHO-recommended vaccine strains from 2015 to 2024, broad spectrum antibodies, neutralizing antibodies, ELISA kits, and gene products.

Influenza Virus Research Reagent Bank

Sino Biological has developed an influenza antigen collection, which features 630+ HA, NA, NP, and M2 antigens from over 300 strains of influenza viruses, including vaccine strains and the pandemic strains such as the 2009 swine flu (A/California/04/2009 (H1N1)). Sino Biological also carries antigen microarrays for influenza-related serology studies.



World's Largest Influenza Virus Research Reagent Center:



10 Antigens

HA (HA0, HAI, HA2, HA), NA, NP, M1, M2, NS1, NS2, PB1, PB2, PA



60 Subtypes

H1-H18, N1-N11, Influenza B



330 Strains

Vaccine Strains
HPAI Strains
Newly Identified Strains



630+ Proteins

High Activity
Covering Most of Hot Research Strains



200+ Antibodies

Neutralizing Antibodies
Pan Antibodies (Broad Spectrum)



1,500+ Genes, ELISA Kits

All Produced In-house

Various Applications



- Virus Diagnostic Research
- Vaccine, Anti-virus Drug, Anti-virus antibody Development
- Basic research

Strong R&D and Manufacture Capability



- All are produced in house
- Rapid development of HA protein in 12 days
- Rapid preclinical development of neutralizing antibody in 6 months

Featured Flu Antigens

Full-length HA (HA0) Proteins

Full-length HA protein is always the first choice of antigen for vaccine development. Because of transmembrane domain, it has been very difficult to manufacture. That is why you can hardly buy HA0.

Category	Subtype	Strain
11055-VNAB	H1N1	A/California/04/2009
11055-VNAB-B		
40043-VNAB		A/Perth/16/2009
40153-VNAB	H3N2	A/Babol/36/2005
40497-VNAB		A/Switzerland/9715293/2013
40359-VNAB	H10N8	A/Jiangxi-Donghu/346/2013
40191-VNAB		B/Massachusetts/03/2010
40498-VNAB	Influenza B	B/PHUKET/3073/2013

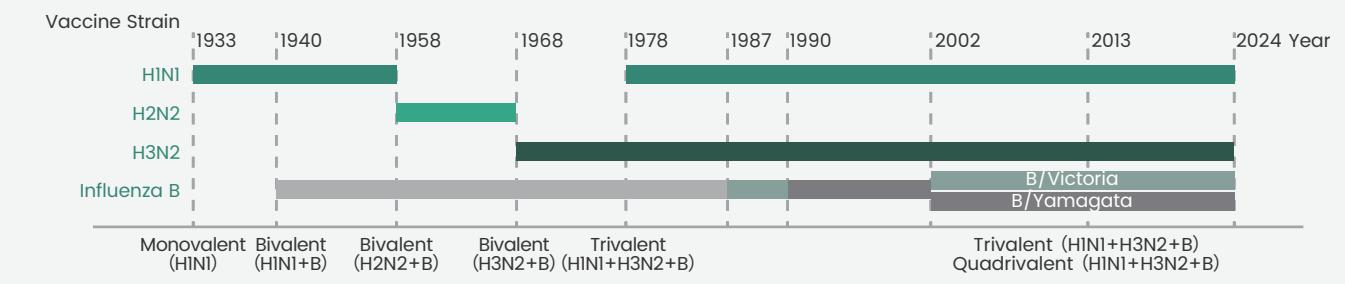
Drug-resistant NA Mutants

Neuraminidase mutants from some strains can resist to anti-influenza drug. Those mutants are useful tools for the development of new drugs.

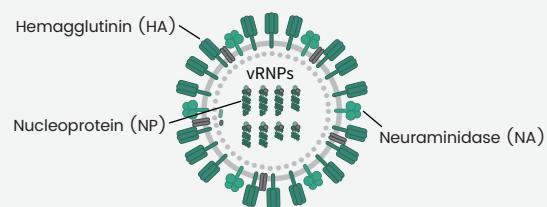
Category	Subtype	Strain	Mutation
11058-VNAHC1	H1N1	A/California/04/2009	H274Y
11058-VNAHC2			N295S
40017-VNAHC1			E119V
40017-VNAHC2	H3N2	A/Babol/36/2005	N294S
40017-VNAHC3			R292K
40017-VNAHC4			H274Y
11676-VNAHC1	H5N1	A/Anhui/1/2005	H274Y

Antigens for 2015–2024 Influenza Vaccine Strains

Vaccination is the most effective way to prevent flu infection. Each year, several different flu strains are selected as vaccine candidates based on surveillance data of the recent isolates and the performance of the vaccines from the previous season. In recent decades, most influenza vaccines are trivalent or quadrivalent, composed of one H1N1, one H3N2, and either one or two type B viruses (Yamagata and Victoria lineage).



To support vaccine research, Sino Biological has released a range of recombinant influenza antigens, including HA, NA, and NP proteins for all WHO-recommended vaccine strains from 2015 to 2024. A large collection of [monoclonal antibodies against the flu antigens](#) are also available to support the development of relevant assays and diagnostic kits.



Flu Antigens for 2015–2024 Vaccine Strains

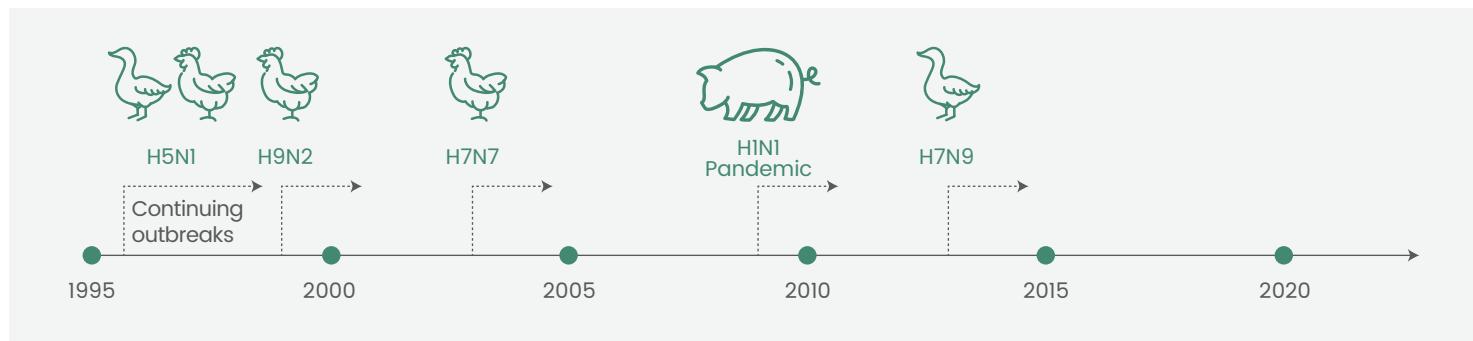
Strains	HA	NA	NP	Year
A/Victoria/4897/2022 (H1N1)	40938-V08B 40938-V08H	40939-V08B		2023-2024
A/Wisconsin/67/2022 (H1N1)	40940-V08B 40940-V08H	40941-V08B	40942-V08B	2023-2024
A/Darwin/9/2021 (H3N2)	40859-V08B 40859-V08H	40860-V08B	40858-V08B	2023-2024, 2022-2023
B/Austria/1359417/2021 (B/Victoria lineage)	40862-V08B 40862-V08H	40863-V08B	40861-V08B	2023-2024, 2022-2023
B/Phuket/3073/2013 (B/Yamagata lineage)	40498-VNAB 40498-V08B 40498-V08H1	40502-V07B	40500-V08B	2023-2024, 2022-2023, 2021-2022, 2020-2021, 2019-2020, 2018-2019, 2017-2018, 2016-2017, 2015-2016
A/Victoria/2570/2019 (H1N1)	40787-V08H 40787-V08H1	40785-V08B	40774-V08B	2022-2023, 2021-2022
A/Wisconsin/588/2019 (H1N1)	40787-V08H 40787-V08H1	40785-V08B	40774-V08B	2022-2023, 2021-2022
A/Darwin/6/2021 (H3N2)	40868-V08B 40868-V08H	40869-V08B1	40858-V08B	2022-2023
A/Cambodia/e0826360/2020 (H3N2)	40789-V08H 40789-V08H1	40784-V08B	40778-V08B	2021-2022
B/Washington/02/2019 (B/Victoria lineage)	40722-V08H	40790-V08B	40755-V08B	2021-2022, 2020-2021
A/Guangdong-Maonan/SWL1536/2019 (H1N1)	40717-V08H		40723-V08B	2020-2021
A/Hawaii/70/2019 (H1N1)	40717-V08H		40724-V08B	2020-2021
A/Hong Kong/2671/2019 (H3N2)	40721-V08H		40753-V08B	2020-2021
A/Hong Kong/45/2019 (H3N2)	40765-V08H		40754-V08B	2020-2021
A/Brisbane/02/2018 (H1N1)	40719-V08H	40767-V08B	40776-V08B	2019-2020
A/Kansas/14/2017 (H3N2)	40720-V08H	40766-V08B	40779-V08B	2019-2020
B/Colorado/06/2017 (B/Victoria lineage)	40581-V08H		40782-V08B	2019-2020, 2018-2019
A/Michigan/45/2015 (H1N1)	40567-V08H1	40568-V08B	40777-V08B	2018-2019, 2017-2018
A/Singapore/INFIMH-16-0019/2016 (H3N2)	40580-V08H		40779-V08B	2018-2019
A/Hong Kong/4801/2014 (H3N2)	40555-V08B	40569-V08B	40781-V08B	2017-2018, 2016-2017
B/Brisbane/60/2008	40016-V08B	40203-VNAHC	40783-V08B	2017-2018, 2016-2017, 2015-2016
A/California/7/2009 (H1N1)	11085-V08B		40205-V08B	2016-2017, 2015-2016
A/Switzerland/9715293/2013 (H3N2)	40497-V08B		40499-V08B	2015-2016

Antigens for Influenza Pandemic Strains

Influenza A viruses were accountable for four pandemics since 1918, including the 2009 H1N1 pandemic. Several influenza zoonotic events happened during the last 20 years. The surveillance of the influenza strains transmitting in humans and other species is essential for timely management of potential pandemics.

Sino Biological has developed a panel of antigens for influenza pandemic strains. These products include HA, NA, and NP proteins. They are designated to be used for a variety of biochemical assays including antibody titer assay, antigen detection assay, and antigenic characterization assay.

Emerging Potential Pandemic Strains in the Last 20 Years



Antigen list for influenza pandemic strains (Partial)

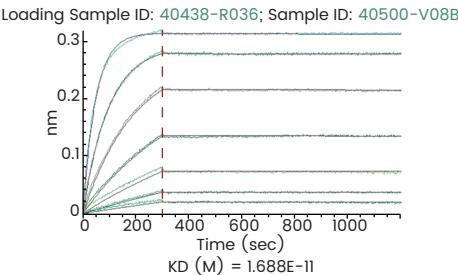
Cat#	Subtype	Strain	Antigen
40090-V08B	H1N1	A/New York/1/1918	HA
11068-V08H	H1N1	A/Brevig Mission/1/1918	HA
11055-V08H	H1N1	A/California/04/2009	HA
40005-V08H	H1N1	A/England/195/2009	HA
40009-V08H	H1N1	A/New York/18/2009	HA
11058-V01H	H1N1	A/California/04/2009	NA
40205-V08B	H1N1	A/California/07/2009	NP
11707-V08H	H3N2	A/Aichi/2/1968	HA
40715-V08H	H3N2	A/Hong Kong/1/1968	HA
11082-V08H1	H7N7	A/Netherlands/219/2003	HA1
40202-V07H	H7N7	A/Netherlands/219/2003	NA
40103-V08H	H7N9	A/Anhui/1/2013	HA
40103-V08H4	H7N9	A/Anhui/1/2013	HA1+HA2
40105-V08H	H7N9	A/Hangzhou/1/2013	HA
40106-V08H	H7N9	A/Pigeon/Shanghai/S1069/2013	HA
40104-V08H	H7N9	A/Shanghai/1/2013	HA
40325-V08B	H7N9	A/Zhejiang/DTID-ZJU10/2013	HA
40325-V08H	H7N9	A/Zhejiang/DTID-ZJU10/2013	HA
40107-V08E	H7N9	A/Anhui/1/2013	M1
40108-V07H	H7N9	A/Anhui/1/2013	NA
40110-V08B	H7N9	A/Anhui/1/2013	NP
11719-V08H	H9N2	A/Guinea fowl/Hong Kong/WF10/99	HA
11229-V08H	H9N2	A/Hong Kong/1073/99	HA
40433-V08B	H10N7	A/blue-winged teal/Louisiana/Sg-00073/2007	HA

Research Reagents for Nucleoprotein (NP)

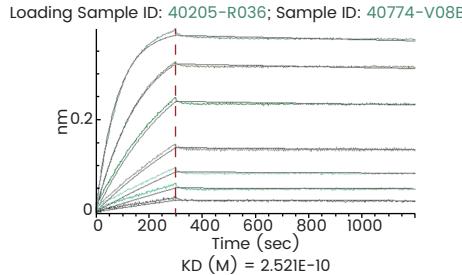
Influenza viral nucleoprotein (NP) is a structural protein that plays a critical role in virus replication and host adaptation. Antibodies targeting NP proteins are commonly used for immunodetection of influenza viruses in various assays, including ELISA, lateral flow assay (LFA), and direct fluorescent antibody tests. These assays can be used in both research and clinical diagnostics. Sino Biological has developed a panel of research reagents to support the study of NP, including NP antigens, highly sensitive pan antibody pairs against the NP protein of Influenza A and Influenza B, as well as ELISA kits.

High Binding Affinity

The binding affinity between immobilized Influenza B NP protein (**Cat#:** 40500-V08B) with the anti-NP antibody (**Cat#:** 40438-R036) in BLI assay.



The binding affinity between immobilized Influenza A NP protein (**Cat#:** 40774-V08B) with the anti-NP antibody (**Cat#:** 40205-R036) in BLI assay.



List of NP Antigens (Partial)

Category	Subtype	Strain	Recommended Composition of Vaccines
40942-V08B (pre-order)	H1N1	A/Wisconsin/67/2022	2023-2024
40204-V08B	H1N1	A/Brevig Mission/1/1918	
40776-V08B	H1N1	A/Brisbane/02/2018	2019-2020
40205-V08B	H1N1	A/California/07/2009	2016-2017, 2015-2016
40723-V08B	H1N1	A/Guangdong-Maonan/SWLI536/2019	2020-2021
40724-V08B	H1N1	A/Hawaii/70/2019	2020-2021
40777-V08B	H1N1	A/Michigan/45/2015	2018-2019, 2017-2018
11675-V08B	H1N1	A/Puerto Rico/8/34/Mount Sinai	
40774-V08B	H1N1	A/Victoria/2570/2019, A/Wisconsin/588/2019	2022-2023, 2021-2022
40858-V08B	H3N2	A/Darwin/6/2021, A/Darwin/9/2021	2023-2024, 2022-2023
40033-V08B	H2N2	A/Ann Arbor/6/1960	
40207-V08B	H3N2	A/Aichi/2/1968	
40778-V08B	H3N2	A/Cambodia/e0826360/2020	2021-2022
40208-V08B	H3N2	A/Hong Kong/1/1968	
40753-V08B	H3N2	A/Hong Kong/2671/2019	2020-2021
40754-V08B	H3N2	A/Hong Kong/45/2019	2020-2021
40781-V08B	H3N2	A/Hong Kong/4801/2014	2017-2018, 2016-2017
40779-V08B	H3N2	A/Kansas/14/2017	2019-2020
40499-V08B	H3N2	A/Switzerland/9715293/2013	2015-2016
40110-V08B	H7N9	A/Anhui/1-BALF_RG6/2013	
40111-V08B	H7N9	A/Shanghai/2/2013	
40500-V08B	Influenza B	B/Phuket/3073/2013	2023-2024, 2022-2023, 2021-2022, 2020-2021, 2019-2020, 2018-2019, 2017-2018, 2016-2017, 2015-2016
40861-V08B	Influenza B	B/Austria/1359417/2021	2023-2024, 2022-2023
40783-V08B	Influenza B	B/Brisbane/60/2008	2017-2018, 2016-2017, 2015-2016
40782-V08B	Influenza B	B/Colorado/06/2017	2019-2020, 2018-2019
40438-V08B	Influenza B	B/Florida/4/2006	
40755-V08B	Influenza B	B/Washington/02/2019	2021-2022, 2020-2021

Research Reagents for Nucleoprotein (NP)

Antibody Pairs for NP Detection

Due to the high frequency of antigenic drift or shift among different influenza strains, broad-spectrum influenza antibodies are particularly desired for flu diagnostics. Sino Biological has identified six Pan antibody pairs against the NP protein of Influenza A and Influenza B, respectively. These matched pairs have been validated in the sandwich ELISA assay with high sensitivity (pg level). They also demonstrate broad reactivity against a large cohort of flu strains.

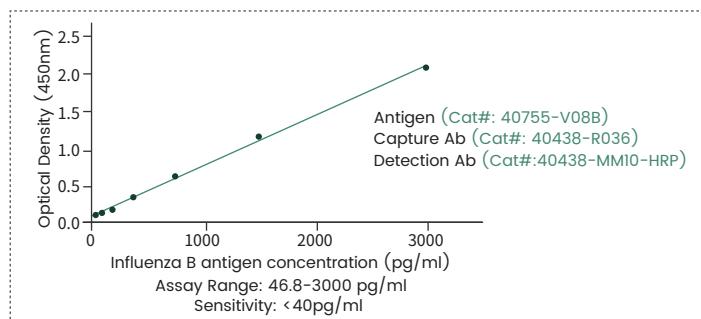
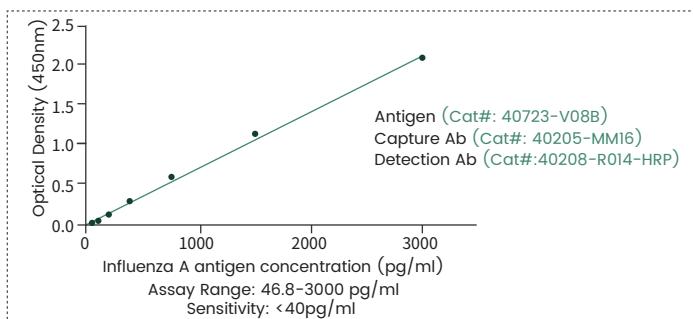
Pan Influenza A NP Detection

Pair No.	Capture Ab	Detection Ab
PanA-1	40205-MM16	40208-R014
PanA-2	40205-R063	40205-MMI18
PanA-3	40208-R117	40205-MMI18

Pan Influenza B NP Detection

Pair No.	Capture Ab	Detection Ab
PanB-1	40438-R004	40438-MMI10
PanB-2	40438-R036	40438-MMI10
PanB-3	40438-MM05	40438-R036

High Sensitivity (pg level)



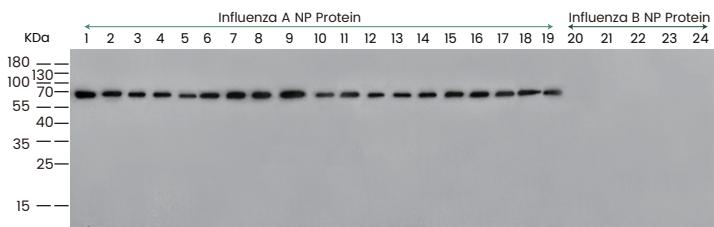
Broad Spectrum and High Specificity

These antibody pairs can detect a broad spectrum of strains within the target subtype, without any cross-reactivity with the other subtypes. 24 kinds of influenza antigens from A or B have been tested by ELISA assay.

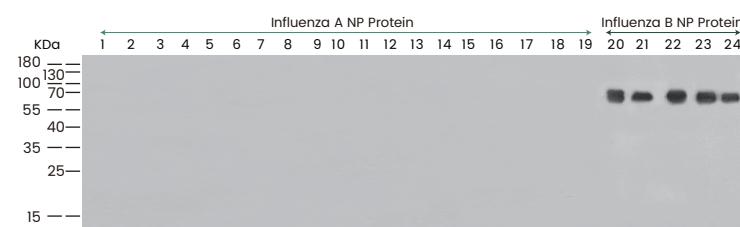
Antigens Pairs	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	A-14	A-15	A-16	A-17	A-18	A-19	B-1	B-2	B-3	B-4	B-5
PanA-1	Strong	Weak	Weak	Weak	Weak	Weak																		
PanA-2	Strong	Weak	Weak	Weak	Weak	Weak																		
PanA-3	Strong	Weak	Weak	Weak	Weak	Weak																		
PanB-1																				Weak	Weak	Weak	Weak	Weak
PanB-2																				Weak	Weak	Weak	Weak	Weak
PanB-3																				Weak	Weak	Weak	Weak	Weak

Binding Capacity: Strong Weak

WB assays show that two antibody clones Cat#: 40208-R010 and Cat#: 40438-R036 can specifically bind to NP of Influenza A and Influenza B, respectively.



Anti-Influenza A NP rabbit mAb (Cat#: 40208-R010) at 1:2000 dilution.



Anti-Influenza B NP rabbit mAb (Cat#: 40438-R036) at 1:2000 dilution.

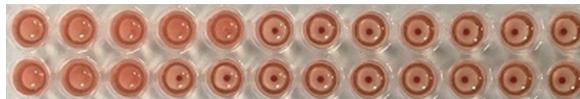
The 24 antigens used in this experiment are listed in the previous page.

Research Reagents for Hemagglutinin (HA)

Hemagglutinin (HA) contains antigenic sites recognized by the host immune system, cleavage sites cleaved by host proteases, receptor binding sites attaching to sialyl receptors on the target cell, and fusion peptides mediating membrane fusion. HA glycoprotein is an important focus of influenza research due to its role in antigenic drift and shift. Sino Biological has developed a panel of research reagents, including HA proteins, antibodies, and activity assays, to support the study of HA.

Bioactive Antigens

- HA: Hemagglutination Activity

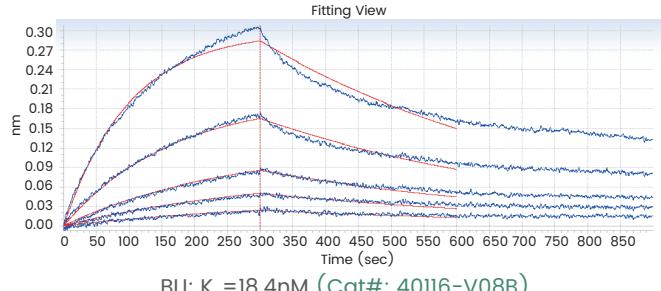


H1N1, A/swine/Shandong/1207/2016 (Cat#: 40651-V08H)



H7N9, A/Anhui/1/2013 (Cat#: 40103-V08B)

- HA: Binding Activity to Sialic Acid



List of Influenza A HA Antigens (Partial)

Cat#	Subtype	Strain
11085-V08H	H1N1	A/California/07/2009
11055-V08H	H1N1	A/California/04/2009
11683-V08H	H1N1	A/New Caledonia/20/1999
11052-V08H	H1N1	A/Brisbane/59/2007
40702-V08H	H1N1	A/swine/England/267/2007
40719-V08H	H1N1	A/Brisbane/02/2018

Cat#	Subtype	Strain
40555-V08B	H3N2	A/Hong Kong/4801/2014
11056-V08H	H3N2	A/Brisbane/10/2007
11972-V08B	H3N2	A/Wisconsin/67/2005
40497-VNAB	H3N2	A/Switzerland/9715293/2013
40555-V08H	H3N2	A/Hong Kong/4801/2014
40354-V08H1	H3N2	A/Texas/50/2012

- HA-specific B cell probes

Specifically binding to B cell that expressed HA-specific Abs

Cat#	Subtype	Strain	Mutation
11055-V08B1	H1N1	A/California/4/2009	Tyr 108 Phe
11683-V08B1	H1N1	A/New Caledonia/20/99	Tyr 108 Phe
40043-V08B1	H3N2	A/Perth/16/2009	Tyr 108 Phe
11060-V08B1	H5N1	A/Indonesia/5/2005	Tyr 107 Phe

- Binding activity to sialic acid

Cat#	Subtype	Strain
40118-V08B	H3N2	A/California/7/2004
40123-V08B	H7N9	A/Hangzhou/3/2013
40325-V08B	H7N9	A/Zhejiang/DTID-ZJU10/2013
11085-V08B	H1N1	A/California/07/2009

List of Influenza B HA Antigens (Partial)

Cat#	Subtype	Strain
40706-V08H	Influenza B	B/Ann Arbor/1/1986
40581-V08H	Influenza B	B/Colorado/06/2017
11053-V08H	Influenza B	B/Florida/4/2006
40709-V08H	Influenza B	B/Hong Kong/ CUHK50947/2004
11716-V08H	Influenza B	B/Malaysia/2506/2004
40705-V08H	Influenza B	B/Maryland/1959
40707-V08H	Influenza B	B/Oita/15/1992

Cat#	Subtype	Strain
40722-V08H	Influenza B	B/Washington/02/2019
40016-V08H1	Influenza B	B/Brisbane/60/2008
40498-V08H1	Influenza B	B/PHUKET/3073/2013
40191-VNAB	Influenza B	B/Massachusetts/03/2010
40581-V08H	Influenza B	B/Colorado/06/2017
40708-V08H	Influenza B	B/Sydney/3/2002

Research Reagents for Hemagglutinin (HA)

Neutralizing Antibodies

H1N1	Anti-HA, Mouse MAb 11055-MM01 Mouse IgG1	H5N1	Anti-HA, Mouse MAB 11048-MM01 Mouse IgG1	Anti-HA 68031-H011 Human IgG1
H7N7	Anti-HA, Rabbit MAb 11082-R019 Rabbit IgG	H10N8	Anti-HA, Mouse MAB 40359-M001 Mouse IgG1	Anti-HA, chimeric MAb 40359-mh001 Human/mouse chimeric IgG

Pan HA Antibodies

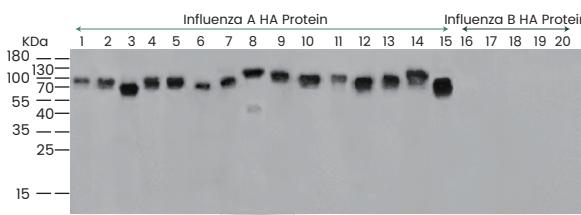
The ELISA and WB assays show that two antibody clones Cat#: 86001-RM01 and Cat#: 11053-R004 can specifically bind to HA of Influenza A and Influenza B, respectively.

Number	Antigens	ELISA Assay	WB Assay	ELISA Assay	WB Assay	Antigen Subtype	Antigen Strain	Vaccine Strain
		86001-RM01	11053-R004					
1	40719-V08H	+++	+++	-	-	H1N1	A/Brisbane/02/2018	2019-2020
2	11055-V08H	+++	+++	-	-		A/California/04/2009	-
3	11085-V08B	+++	+++	-	-		A/California/07/2009	2016-2017, 2015-2016
4	40717-V08H	+++	+++	-	-		A/Guangdong-Maonan/SWL1536/2019	2020-2021
5	40567-V08H1	+++	+++	-	-		A/Michigan/45/2015	2018-2019, 2017-2018
6	11684-V08H	+++	+++	-	-		A/Puerto Rico/8/1934	-
7	40787-V08H	+++	+++	-	-		(A/Wisconsin/588/2019) / (A/Victoria/2570/2019)	2022-2023, 2021-2022
8	11056-V08H	+++	+++	-	-		A/Brisbane/10/2007	-
9	40789-V08H	+++	+++	-	-		A/Cambodia/e0826360/2020	2021-2022
10	40721-V08H	+++	+++	+	-		A/Hong Kong/2671/2019	2020-2021
11	40765-V08H	+++	+++	-	-		A/Hong Kong/45/2019	2020-2021
12	40555-V08B	+++	+++	-	-		A/Hong Kong/4801/2014	2017-2018, 2016-2017
13	40720-V08H	+++	+++	-	-		A/Kansas/14/2017	2019-2020
14	40580-V08H	+++	+++	-	-		A/Singapore/INFIMH-16-0019/2016	2018-2019
15	40497-V08B	+++	+++	-	-		A/Switzerland/9715293/2013	2015-2016
16	40016-V08B	-	-	+++	+++	Influenza B	B/Brisbane/60/2008	2017-2018, 2016-2017, 2015-2016
17	40581-V08H	-	-	+++	+++		B/Colorado/06/2017	2019-2020, 2018-2019
18	11053-V08H	-	-	+++	+++		B/Florida/4/2006	-
19	40498-V08B	-	-	+++	+++		B/PHUKET/3073/2013	2023-2024, 2022-2023, 2021-2022, 2020-2021, 2019-2020, 2018-2019, 2017-2018, 2016-2017, 2015-2016
20	40722-V08H	-	-	+++	+++		B/Washington/02/2019	2021-2022, 2020-2021

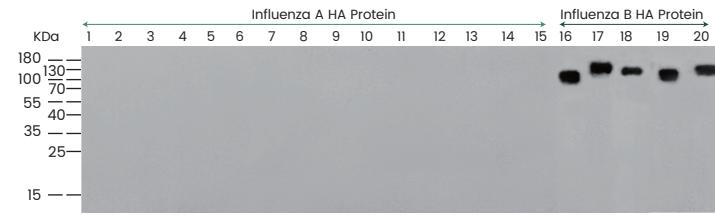
-: No Effect; +: Medium/Minimal Effect; +++: Strong Effect

○ Western Blot Analysis of HA Antibodies to aforementioned 20 Influenza Antigens

For antigens of each lane, please refer to above form.



Anti-Influenza A HA rabbit mAb (Cat#: 86001-RM01) at 1:5000 dilution.



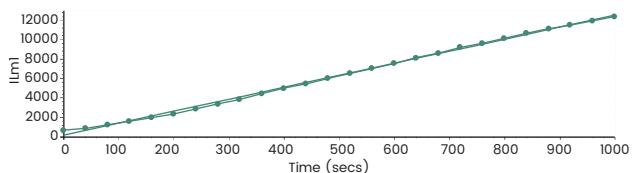
Anti-Influenza B HA rabbit mAb (Cat#: 11053-R004) at 1:10000 dilution.

Research Reagents for Neuraminidase (NA)

Neuraminidases (NA) are enzymes on the surface of influenza A and B. They cleave sialic acid groups from glycoproteins and are required for influenza virus replication. In addition to the mutations that arise due to antigenic drift, the NA of influenza A viruses can exist in different forms. It is a major target for influenza antivirals. Sino Biological has developed a panel of research reagents, including NA proteins, antibodies, and activity assays, to support the study of NA.

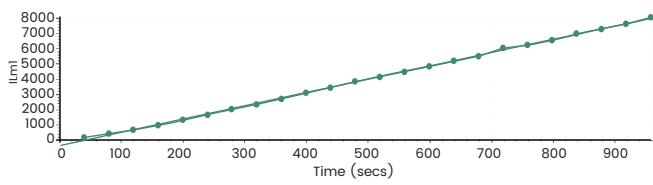
NA: Enzymatic Activity

H1N1, A/Brisbane/02/2018 (Cat#: 40767-V08B)



Measured NA's ability to cleave 2'-(4-Methylumbelliferyl)-α-D-N-acetyl-neuraminic acid. The specific activity is 40296 pmoles/min/μg.

H1N1, A/Brisbane/02/2018 (Cat#: 40569-V08B)



Measured NA's ability to cleave 2'-(4-Methylumbelliferyl)-α-D-N-acetyl-neuraminic acid. The specific activity is 29781 pmoles/min/μg.

List of Influenza NA Antigens (Partial)

Cat#	Subtype	Strain
40860-V08B	H3N2	A/Darwin/9/2021
40869-V08B1	H3N2	A/Darwin/6/2021
40863-V08B	B/Victoria lineage	B/Austria/1359417/2021
11058-V08B	H1N1	A/California/04/2009
40568-V07H	H1N1	A/Michigan/45/2015
40733-V07H	H1N1	A/swine/Canada/01093/2006
40730-V07H	H1N1	A/Beijing/262/1995
40766-V08B	H3N2	A/Kansas/14/2017
40569-V07H	H3N2	A/Hong Kong/4801/2014
40784-V08B	H3N2	A/Cambodia/e0826360/2020
40199-V07H	H3N2	A/Aichi/2/1968
40235-V07B	H4N6	A/mallard/Ohio/657/2002
11676-V08B	H5N1	A/Anhui/1/2005
40108-V07H	H7N9	A/Anhui/1/2013
40109-V07H	H7N9	A/Shanghai/1/2013
40352-V07B	H10N8	A/duck/Guangdong/E1/2012
40502-V07B	Influenza B	B/PHUKET/3073/2013
40790-V08B	Influenza B	B/Washington/02/2019

Antibodies for NA Detection

Cat#	Antibody Type	Application	Antigen
11058-MM07	Mouse MAb	WB, ELISA	A/California/04/2009 (H1N1)
11058-R001	Rabbit MAb	WB, ELISA	A/California/04/2009 (H1N1)
40017-RP01	Rabbit PAb	ELISA	A/Babol/36/2005 (H3N2)
40017-T62	Rabbit PAb	WB, ELISA	A/Babol/36/2005 (H3N2)
40235-RP01	Rabbit PAb	ELISA	A/mallard/Ohio/657/2002 (H4N6)
40235-T62	Rabbit PAb	WB, ELISA	A/mallard/Ohio/657/2002 (H4N6)
40018-RP01	Rabbit PAb	ELISA	A/Hubei/2011 (H5N1)
40018-T30	Rabbit PAb	ELISA	A/Hubei/1/2010 (H5N1)
40018-T62	Rabbit PAb	WB, ELISA	A/Hubei/1/2010 (H5N1)
40202-RP01	Rabbit PAb	ELISA	A/Netherlands/219/2003 (H7N7)
40202-T62	Rabbit PAb	WB, ELISA	A/Netherlands/219/2003 (H7N7)
40040-MM02	Mouse MAb	ELISA	A/Hong Kong/1073/99 (H9N2)
40040-RP01	Rabbit PAb	ELISA	A/Hong Kong/1073/99 (H9N2)
40040-T62	Rabbit PAb	WB, ELISA	A/Hong Kong/1073/99 (H9N2)

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