

Antisera Panel to Isolated Antigens of Influenza Viruses

Catalog No. NR-10208

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Lot No. 58221158

Lot No. 61430538

For research use only. Not for human use.

Contributor and Manufacturer:

National Institutes of Allergy and Infectious Diseases (NIAID),
National Institutes of Health (NIH)

Product Description:

NR-10208 contains antisera prepared against isolated hemagglutinin (HA) and neuraminidase (NA) glycoproteins, isolated matrix protein and ribonucleoprotein (RNP) subunits of reference strains of influenza A and B viruses.¹ Antisera were prepared in goats with antigen emulsified in Freund's complete antigen. The antisera are described in "NIAID Resources for Influenza Research" at www.kamtekinc.com/pdfdoc/niaidfc.pdf.¹

All antisera are available as individual products by ordering the BEI Resources Catalog Number indicated in Table 1.

Material Provided/Storage:

Content: Lyophilized serum

Original Volume: 1.0 mL

Storage Temperature: 4°C

Functional Activity:

Immunodiffusion:

Conditions: Immunodiffusion assays were performed using Hyland double immunodiffusion plates after disruption of purified virus with SDS as described.² See Table 2 for influenza A viruses and Table 5 for influenza B viruses.

Hemagglutination Inhibition (HI):

Conditions: HI activity was determined as described.³ Briefly, the dilutions of antisera were allowed to interact with antigen for 60 minutes at 20°C before the addition of chicken erythrocytes. See Table 3 for influenza A viruses and Table 5 for influenza B viruses.

Neuraminidase Inhibition (NI):

Conditions: Neuraminidase (NA) activity was assayed by the method of Warren⁴, except that the color was extracted into *n*-butanol containing 5% (v/v) concentrated hydrochloric acid.⁵ NI tests were performed as described.⁶ To preclude steric inhibition in the NI tests, an antigenic hybrid possessing an irrelevant HA subunit was used. See Table 4 for influenza A viruses and Table 5 for influenza B viruses.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: Antisera Panel to Isolated Antigens of Influenza Virus, NR-10208."

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories. 5th ed. Washington, DC: U.S. Government Printing Office, 2009; see www.cdc.gov/biosafety/publications/bmbl5/index.htm.

Disclaimers:

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References:

1. NIAID. "NIAID Resources for Influenza Research". (1998): www.kamtekinc.com/pdfdoc/niaidfc.pdf.

2. Schild, G. C. and H. G. Pereira. "Characterization of the Ribonucleoprotein and Neuraminidase of Influenza A Viruses by Immunodiffusion." *J. Gen. Virol.* 4 (1969): 355–363. PubMed: 4977660.
3. Fazekas de St. Groth, S. and R. G. Webster. "Disquisitions on Original Antigenic Sin. I. Evidence in Man." *J. Exp. Med.* 124 (1966): 331–345. PubMed: 5922742.
4. Warren, L. "The Thiobarbituric Acid Assay of Sialic Acids." *J. Biol. Chem.* 234 (1959): 1971–1975. PubMed: 13672998.
5. Aminoff, D. "Methods for the Quantitative Estimation of N-acetylneuraminic Acid and their Application to Hydrolysates of Sialomucoids." *Biochem. J.* 81 (1961): 384–392. PubMed: 13860975.
6. Webster, R. G. and H. G. Pereira. "A Common Surface Antigen in Influenza Viruses from Human and Avian Sources." *J. Gen. Virol.* 3 (1968): 201–208. PubMed: 5698682.

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Table 1 – List of Antisera Included in NR-10208 Panel

BEI Catalog No.	Individual Product Name
NR-3148	Polyclonal Anti-Influenza Virus H1 (H0) Hemagglutinin (HA), A/Puerto Rico/8/34 (H1N1) (antiserum, Goat)
NR-3116	Polyclonal Anti-Influenza Virus H1 (H0) Hemagglutinin (HA), A/Bel/42 (H1N1) (antiserum, Goat)
NR-3117	Polyclonal Anti-Influenza Virus H1 Hemagglutinin (HA), A/Fort Monmouth/1/47 (H1N1) (antiserum, Goat)
NR-3150	Polyclonal Anti-Influenza Virus H2 Hemagglutinin (HA), A/Singapore/1/57 (H2N2) (antiserum, Goat)
NR-3118 ^a	Polyclonal Anti-Influenza Virus H3 Hemagglutinin (HA), A/Hong Kong/1/68 (H3N2) (antiserum, Goat)
NR-3163 ^b	Polyclonal Anti-Influenza Virus H1 (Hsw1) Hemagglutinin (HA), A/swine/Iowa/15/30 (H1N1) (antiserum, Goat)
NR-3161	Polyclonal Anti-Influenza Virus H7 (Heq1) Hemagglutinin (HA), A/equine/Prague/1/56 (H7N7) (antiserum, Goat)
NR-3162	Polyclonal Anti-Influenza Virus H3 (Heq2) Hemagglutinin (HA), A/equine/Miami/1/63 (H3N8) (antiserum, Goat)
NR-3152	Polyclonal Anti-Influenza Virus H7 (Hav1) Hemagglutinin (HA), A/FPV/Dutch/27 (H7N7) (antiserum, Goat)
NR-3153	Polyclonal Anti-Influenza Virus H10 (Hav2) Hemagglutinin (HA), A/chicken/Germany/N/49 (H10N7) (antiserum, Goat)
NR-3154	Polyclonal Anti-Influenza Virus H11 (Hav3) Hemagglutinin (HA), A/duck/England/1/56 (H11N6) (antiserum, Goat)
NR-3155	Polyclonal Anti-Influenza Virus H4 (Hav4) Hemagglutinin (HA), A/duck/Czechoslovakia/56 (H4N6) (antiserum, Goat)
NR-3156	Polyclonal Anti-Influenza Virus H5 (Hav5) Hemagglutinin (HA), A/tern/South Africa/61 (H5N3) (antiserum, Goat)
NR-3158	Polyclonal Anti-Influenza Virus H6 (Hav6) Hemagglutinin (HA), A/turkey/Massachusetts/65 (H6N2) (antiserum, Goat)
NR-3159	Polyclonal Anti-Influenza Virus H3 (Hav7) Hemagglutinin (HA), A/duck/Ukraine/1/63 (H3N8) (antiserum, Goat)
NR-3160	Polyclonal Anti-Influenza Virus H8 (Hav8) Hemagglutinin (HA), A/turkey/Ontario/6118/68 (H8N4) (antiserum, Goat)
NR-3136 ^c	Polyclonal Anti-Influenza Virus N1 Neuraminidase (NA), A/New Jersey/8/76 (H1N1) (antiserum, Goat)
NR-3137	Polyclonal Anti-Influenza Virus N2 Neuraminidase (NA), A/Singapore/1/57 (H2N2) (antiserum, Goat)
NR-3144	Polyclonal Anti-Influenza Virus N7 (Neq1) Neuraminidase (NA), A/equine/Prague/1/56 (H7N7) (antiserum, Goat)
NR-3145	Polyclonal Anti-Influenza Virus N8 (Neq2) Neuraminidase (NA), A/equine/Miami/1/63 (H3N8) (antiserum, Goat)
NR-3111	Polyclonal Anti-Influenza Virus N6 (Nav1) Neuraminidase (NA), A/duck/England/1/56 (H11N6) (antiserum, Goat)
NR-3112	Polyclonal Anti-Influenza Virus N3 (Nav2) Neuraminidase (NA), A/tern/South Africa/61 (H5N3) (antiserum, Goat)
NR-3141	Polyclonal Anti-Influenza Virus N3 (Nav3) Neuraminidase (NA), A/turkey/England/63 (H7N3) (antiserum, Goat)
NR-3140	Polyclonal Anti-Influenza Virus N4 (Nav4) Neuraminidase (NA), A/turkey/Ontario/6118/68 (H8N4) (antiserum, Goat)
NR-3143	Polyclonal Anti-Influenza Virus N5 (Nav5) Neuraminidase (NA), A/shearwater/Australia/1/72 (H6N5) (antiserum, Goat)
NR-3133	Polyclonal Anti-Influenza Virus Ribonucleoprotein (RNP), A/Scotland/840/74 (H3N2) (antiserum, Goat)
NR-3134	Polyclonal Anti-Influenza Virus Matrix Protein, A/NWS/34 (HA) x A/equine/Prague/1/56 (NA) (H1N7) (antiserum, Goat)
NR-3120	Polyclonal Anti-Influenza Virus Hemagglutinin (HA), B/Lee/40 (antiserum, Goat)
NR-3165	Polyclonal Anti-Influenza Virus Hemagglutinin (HA), B/Hong Kong/8/73 (antiserum, Goat)
NR-3114	Polyclonal Anti-Influenza Virus Matrix Protein, B/Lee/40 (antiserum, Goat)
NR-3147	Polyclonal Anti-Influenza Virus Neuraminidase (NA), B/Hong Kong/8/73 (antiserum, Goat)
NR-3110	Polyclonal Anti-Influenza Virus Neuraminidase (NA), B/Hong Kong/8/73 (antiserum, Goat)

^aNR-3118: The label for this reagent incorrectly indicates that it is antiserum against the H3 HA protein of A/Aichi/2/68 (H3N2).

^bNR-3163: The label for this reagent incorrectly indicates that it is antiserum against the H1 (Hsw1) HA protein of A/swine/Wisconsin/15/30 (H1N1).

^cNR-3136: The label for this reagent incorrectly indicates that it is antiserum against the H7 (Heq1) HA and N1 NA protein of recombinant A/equine/Prague/1/56 (HA) x New Jersey/8/76 (NA) (H7N1).

Table 2

Antisera to Influenza A Virus Antigens Prepared in Goats, Summary of Reactions in Immunodiffusion Tests

BEI Catalog No.	NIAID Catalog No.	Goat Antiserum To: ^a	Strain of Influenza Virus	Reactions in Double Immunodiffusion Tests ^a	Antibodies to RNP, Double Immunodiffusion	Antibodies to Matrix Protein, Single Radial Diffusion
NR-3148	V-314-511-157	H1 (H0)	A/Puerto Rico/8/34 (H1N1)	H1 (H0)	-	-
NR-3117	V-314-521-157	H1	A/Fort Monmouth/1/47 (H1N1)	H1	-	-
NR-3150	V-314-541-157	H2	A/Singapore/1/57 (H2N2)	H2	-	-
NR-3118	V-314-591-157	H3	A/Hong Kong/1/68 (H3N2)	H3, H3 (Heq2) ^b , H3 (Hav7) ^b	-	-
NR-3163	V-317-501-157	H1 (Hsw1)	A/swine/Iowa/15/30 (H1N1)	H1 (Hsw1)	-	-
NR-3161	V-316-561-157	H7 (Heq1)	A/equine/Prague/1/56 (H7N7)	H7 (Heq1), H7 (Hav1) ^b	-	-
NR-3162	V-316-571-157	H3 (Heq2)	A/equine/Miami/1/63 (H3N8)	H3 (Heq2), H3 (Hav7) ^b	-	-
NR-3152	V-315-501-157	H7 (Hav1)	A/FPV/Dutch/27 (H7N7)	H7 (Hav1), H7 (Heq1) ^b	±	-
NR-3153	V-315-511-157	H10 (Hav2)	A/chicken/Germany/N/49 (H10N7)	H10 (Hav2)	-	+
NR-3154	V-315-521-157	H11 (Hav3)	A/duck/England/1/56 (H11N6)	H11 (Hav3)	-	-
NR-3155	V-315-531-157	H4 (Hav4)	A/duck/Czechoslovakia/56 (H4N6)	H4 (Hav4) very weak	-	-
NR-3156	V-315-541-157	H5 (Hav5)	A/tern/South Africa/61 (H5N3)	H5 (Hav5), H1 (H0) ^b , H1 ^b	+	-
NR-3158	V-315-552-157	H6 (Hav6)	A/turkey/Massachusetts/65 (H6N2)	H6 (Hav6)	-	-
NR-3159	V-315-561-157	H3 (Hav7)	A/duck/Ukraine/1/63 (H3N8)	H3 (Hav7), H3 ^b , H3 (Heq2) ^b	-	-
NR-3160	V-315-571-157	H8 (Hav8)	A/turkey/Ontario/6118/68 (H8N4)	H8 (Hav8)	+	-
NR-3136	V-308-513-157	N1	A/New Jersey/8/76 (H1N1)	N1, H7 (Heq1) ^c	+	+
NR-3137	V-308-541-157	N2	A/Singapore/1/57 (H2N2)	N2	-	-
NR-3144	V-310-561-157	N7 (Neq1)	A/equine/Prague/1/56 (H7N7)	N7 (Neq1)	-	±
NR-3145	V-310-571-157	N8 (Neq2)	A/equine/Miami/1/63 (H3N8)	N8 (Neq2), H1 (H0) ^c	±	-
NR-3111	V-309-521-157	N6 (Nav1)	A/duck/England/1/56 (H11N6)	N6 (Nav1)	-	+
NR-3112	V-309-541-157	N3 (Nav2)	A/tern/South Africa/61 (H5N3)	N3 (Nav2), N3 (Nav3) ^b , H1 (H0) ^c	+	+
NR-3141	V-309-581-157	N3 (Nav3)	A/turkey/England/63 (H7N3)	N3 (Nav3), N3 (Nav2) ^b , H1 (H0) ^c	+	±
NR-3140	V-309-571-157	N4 (Nav4)	A/turkey/Ontario/6118/68 (H8N4)	N4 (Nav4)	+	-
NR-3143	V-309-592-157	N5 (Nav5)	A/shearwater/Australia/1/72 (H6N5)	N5 (Nav5)	-	-
NR-3133	V-304-501-157	RNP	A/Scotland/840/74 (H3N2)	RNP	+	±
NR-3134	V-306-501-157	Matrix	A/NWS/34 (H1)-A/Equine/Prague/1/56 (N7)	Matrix	-	+

^aFormer nomenclature in parentheses

^bCross reaction to related antigen

^cCross reaction to unrelated antigen

+ = strong reaction; ± = trace reaction

Immunodiffusion test results are not available for NR-3116

Table 4

Neuraminidase Inhibition Titers of Antisera to the Isolated Subunits of Influenza A Viruses

BEI Catalog No.	NIAID Catalog No.	Goat Antiserum To: ^a	Reference Strain of Influenza Virus	H1N1 (A/New Jersey/8/76)	N2 (A/Singapore/1/57)	H7N7 (A/equine/Prague/1/56)	H3N8 (A/equine/Miami/1/63)	H11N6 (A/duck/England/1/56)	H5N3 (A/tern/South Africa/61)	H8N4 (A/turkey/Ontario/6118/68)	H6N5 (A/shearwater/Australia/72)
NR-3136	V-308-513-157	N1	A/New Jersey/8/76 (H1N1)	300	<	10	<	<	<	<	<
NR-3137	V-308-541-157	N2	A/Singapore/1/57 (H2N2)	<	2,000	<	<	<	<	<	<
NR-3144	V-310-561-157	N7 (Neq1)	A/equine/Prague/1/56 (H7N7)	<	<	800	<	<	<	<	<
NR-3145	V-310-571-157	N8 (Neq2)	A/equine/Miami/1/63 (H3N8)	<	<	<	1,000	<	<	<	<
NR-3111	V-309-521-157	N6 (Nav1)	A/duck/England/1/56 (H11N6)	<	<	<	<	600	<	<	<
NR-3112	V-309-541-157	N3 (Nav2)	A/tern/South Africa/61 (H5N3)	<	<	<	<	<	1,000	<	<
NR-3141	V-309-581-157	N3 (Nav3)	A/turkey/England/63 (H7N3)	<	<	<	<	<	150	<	<
NR-3140	V-309-571-157	N4 (Nav4)	A/turkey/Ontario/6118/68 (H8N4)	<	<	<	<	<	<	1,000	<
NR-3143	V-309-592-157	N5 (Nav5)	A/shearwater/Australia/72 (H6N5)	<	<	<	<	<	<	<	2,000

^aFormer nomenclature in parentheses

< = Less than 20

Figures are the reciprocals of the dilution at the end points as given in *Advanced Laboratory Techniques for Influenza Diagnosis*.

Table 5

Antisera to Influenza B Viruses, Summary of Reactions

BEI Catalog No.	NIAID catalog No.	Antisera	Hemagglutinin Inhibition			Neuraminidase Inhibition		Double Immunodiffusion		
			B/Lee/40	B/HK/8/73	A/NWS/34	B/Lee/40	B/HK/8/73	B/Lee/40	B/HK/8/73	A/NWS/34
NR-3120	V-318-501-157	B/Lee/40 (HA)	10,240	80	<	<	<	+	±	-
NR-3165	V-318-511-157	B/Hong Kong/8/73 (HA)	160	20,480	<	<	10	±	+	-
NR-3114	V-312-501-157	B/Lee/40 (NA)	80	160	<	1,000	150	+	±	-
NR-3147	V-312-511-157	B/Hong Kong/8/73 (NA)	160	40	<	700	100	±	+	-
NR-3110	V-307-501-157	B/Hong Kong/8/73 (Matrix)	<	<	<	<	<	+	+	-

+ Strong line of precipitation

± Weak line of precipitation

< = Less than 20

Figures are the reciprocals of the dilution at the end points as given in *Advanced Laboratory Techniques for Influenza Diagnosis*.