

Certificate of Analysis for NR-436

Peptide Array West Nile Virus Protein NS1

Catalog No. NR-436

Product Description: A 46-peptide array spanning the NS1 protein of the NY99-flamingo382-99 strain of West Nile Virus. Peptides are 15- to 19-mers, with 10 or 11 amino acid overlaps. Each vial contains 1 mg of lyophilized NR-436.

Lot: 3745091

The following information applies to all 46 peptides:

- Appearance
- Mass spectral analysis
- Counter Ion

White lyophilized powder
Electrospray "Exhibits correct MW"
Ammonium acetate (Peptides 3, 11)
Trifluoroacetate (all other Peptides)

Peptide-specific information is shown in the two tables below.

Table 1						
Peptide	Date of Mfg.	Length	Sequence	Molecular Weight (amu)	Purity by HPLC ^a	Peptide Content ^b
1	7/12/2004	19	DTGCAIDISRQELRCGSGV	1980.2	90.4%	80.1%
2	6/29/2004	18	RQELRCGSGVFIHNDVEA	2030.3	75.3%	76.7%
3	6/18/2004	18	GVEFIHNDVEAWMDRYKYY	2306.6	72.7%	79.5%
4	6/15/2004	18	EAWMDRYKYYPETPQGLA	2218.5	97.7%	83.9%
5	6/15/2004	18	YYPETPQGLAKIIQKAHK	2085.4	96.3%	77.2%
6	6/29/2004	17	LAKIIQKAHKEGVCGLR	1864.3	93.2%	78.8%
7	7/9/2004	17	AHKEGVCGLRSVSRLEH	1878.1	90.8%	81.3%
8	6/16/2004	17	GLRSVSRLEHQMWKAVK	2026.4	81.9%	78.2%
9	6/16/2004	18	LEHQMWKAVKDELNTLLK	2197.5	99.2%	82.1%
10	6/16/2004	18	VKDELNTLLKENGVDLSV	1986.3	97.3%	81.5%
11	6/24/2004	18	LKENGVDLSVVVEKQEGM	1974.3	64.9%	79.3%
12	6/21/2004	18	SVVVEKQEGMYKSAPKRL	2049.4	89.8%	82.4%
13	6/23/2004	17	GMYSAPKRLTATTEKL	1895.3	91.0%	79.7%
14	6/23/2004	17	KRLTATTEKLEIGWKAW	2031.4	99.0%	78.7%
15	6/14/2004	17	EKLEIGWKAWGKSILFA	1976.3	81.4%	77.8%
16	6/10/2004	18	KAWGKSILFAPELANNTF	2007.3	97.7%	80.7%
17	6/7/2004	18	FAPELANNTFVVDGPETK	1949.1	97.3%	80.6%
18	6/25/2004	18	TFVVDGPETKECPTQNRA	1992.2	88.7%	79.7%
19	6/8/2004	16	TKECPTQNRANSLEV	1876.1	93.2%	78.9%
20	6/8/2004	18	TQNRANSLEVEDFGFGL	2083.2	92.3%	82.3%

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Table 1 (continued)

Peptide	Date of Mfg.	Length	Sequence	Molecular Weight (amu)	Purity by HPLC ^a	Peptide Content ^b
21	6/15/2004	18	LEVEDFGFGLTSTRMFLK	2090.4	98.1%	79.1%
22	6/30/2004	18	GLTSTRMFLKVRESNTTE	2070.4	90.5%	80.8%
23	6/11/2004	16	LKVRESNTTECDISKII	1836.1	86.0%	79.8%
24	7/9/2004	18	NTTECDISKIIGTAVKNNL	1921.2	38.3%	79.0%
25	6/16/2004	18	IIGTAVKNNLAIHSDLSY	1929.2	97.0%	80.9%
26	6/14/2004	16	NLAIHSDLSYWIESRL	1917.2	91.6%	81.5%
27	6/10/2004	18	DSLYWIESRLNDTWKLER	2324.6	81.4%	81.9%
28	6/28/2004	17	RLNDTWKLERAVLGEVK	2027.4	96.6%	79.5%
29	6/24/2004	18	LERAVLGEVKCTWPETH	2055.3	63.4%	80.3%
30	6/11/2004	18	VKSCTWPETHTLWGDGIL	2043.3	97.8%	80.4%
31	6/28/2004	18	THTLWGDGILESDLIIPV	1979.3	90.8%	81.3%
32	6/23/2004	16	ILES DLIIPVTLAGPR	1707.0	92.2%	83.5%
33	6/21/2004	16	IIPVTLAGPRSNHNRR	1801.1	90.9%	80.4%
34	6/29/2004	18	AGPRSNHNRRPGYKTQNO	2081.2	92.2%	81.5%
35	6/25/2004	18	RRPGYKTQNOGPWDEGRV	2144.3	94.7%	80.9%
36	6/23/2004	16	NQGPWDEGRVEIDFDY	1940.0	94.1%	81.6%
37	6/25/2004	18	EGRVEIDFDYCPGTTVTL	2015.2	63.0%	80.5%
38	6/28/2004	17	DYCPGTTVTLSESCGHR	1826.0	92.4%	81.2%
39	6/25/2004	15	VTLSESCGHRGPATR	1570.7	92.3%	79.9%
40	6/21/2004	18	SCGHRGPATRTTTSGLK	1859.1	95.4%	78.7%
41	7/6/2004	17	TRTTTSGLKLITDWCCR	1971.2	79.0%	81.8%
42	6/28/2004	18	GKLITDWCCRSTLPPLR	2062.5	79.2%	79.3%
43	6/29/2004	18	CRSCTLPPLRYQTDSCGW	2086.4	99.0%	81.5%
44	6/28/2004	16	LRQYQTDSCGWYGMER	1978.2	79.1%	79.4%
45	6/28/2004	17	SGCWYGMERIPQRHDEK	2092.3	43.5%	80.8%
46	7/6/2004	19	EIRPQRHDEKTLVQSQVNA	2248.5	78.7%	79.1%

^a% full-length

^bRemainder is salt and water

Table 2 - Amino Acid Analysis

Peptide		Ala (A)	Arg (R)	Asx (N,D)	Cys (C)	Glx (Q,E)	Gly (G)	His (H)	Ile (I)	Leu (L)	Lys (K)	Met (M)	Phe (F)	Pro (P)	Ser (S)	Thr (T)	Trp (W)	Tyr (Y)	Val (V)
1	Expected	1.00	2.00	2.00	2.00	2.00	3.00		2.00	1.00					2.00	1.00			1.00
	Actual	1.00	2.20	1.99	0.00 ^a	2.25	3.01		0.98	1.00					1.95	0.81			1.20
2	Expected	1.00	2.00	2.00	1.00	3.00	2.00	1.00	1.00	1.00			1.00						2.00
	Actual	1.12	1.99	2.23	0.00 ^a	3.00	2.37	0.80	0.80	1.01			0.81		1.10				1.83
3	Expected	1.00	1.00	3.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00				1.00	3.00	2.00
	Actual	1.00	1.03	2.96		0.84	1.03	0.74	0.81		1.09	1.17	0.70				0.00 ^a	3.23	1.73
4	Expected	2.00	1.00	1.00		3.00	1.00			1.00	1.00	1.00		2.00		1.00	1.00	3.00	
	Actual	2.00	1.04	1.02		3.02	1.03			1.07	1.05	0.80		2.02		1.00	0.00 ^a	3.28	
5	Expected	2.00				3.00	1.00	1.00	2.00	1.00	3.00			2.00		1.00		2.00	
	Actual	2.00				3.12	1.04	1.05	1.01 ^b	1.08	3.14			1.89		0.94		1.90	
6	Expected	2.00	1.00		1.00	2.00	2.00	1.00	2.00	2.00	3.00								1.00
	Actual	2.02	1.03		0.00 ^a	2.00	2.15	1.03	0.88 ^b	2.09	3.03								1.06
7	Expected	1.00	2.00		1.00	2.00	2.00	2.00		2.00	1.00			2.00					2.00
	Actual	1.00	2.00		0.00 ^a	2.14	2.06	2.20		1.97	1.04			1.95					2.06
8	Expected	1.00	2.00			3.00	1.00	1.00		2.00	1.00	1.00		2.00			1.00		2.00
	Actual	1.00	2.02			2.91	0.96	1.17		1.95	0.88	1.03		1.72			0.00 ^a		2.07
9	Expected	1.00		2.00		4.00		1.00		4.00	2.00	1.00				1.00	1.00		1.00
	Actual	1.00		2.02		4.16		1.09		4.20	1.93	1.04				0.97	0.00 ^a		0.98
10	Expected			4.00		2.00	1.00			4.00	2.00			1.00					3.00
	Actual			3.73		2.00	1.04			4.21	1.74			0.89		0.92			3.03

Table 2 - Amino Acid Analysis (continued)

Peptide		Ala (A)	Arg (R)	Asx (N,D)	Cys (C)	Glx (Q,E)	Gly (G)	His (H)	Ile (I)	Leu (L)	Lys (K)	Met (M)	Phe (F)	Pro (P)	Ser (S)	Thr (T)	Trp (W)	Tyr (Y)	Val (V)
11	Expected			2.00		4.00	2.00			2.00	2.00	1.00			1.00				4.00
	Actual			1.95		4.00	2.19			2.07	2.16	0.98			1.04				3.59 ^p
12	Expected	1.00	1.00			3.00	1.00			1.00	3.00	1.00		1.00	2.00			1.00	3.00
	Actual	1.02	0.99			3.03	1.01			1.00	3.06	1.04		0.93	1.71			1.04	2.09 ^p
13	Expected	2.00	1.00			1.00	1.00			2.00	3.00	1.00		1.00	1.00	3.00		1.00	
	Actual	1.94	1.00			1.00	0.97			2.09	3.08	0.87		0.89	0.97	2.78		0.98	
14	Expected	2.00	1.00			2.00	1.00		1.00	2.00	3.00					3.00	2.00		
	Actual	2.00	0.98			1.93	1.01		1.01	2.04	3.19					2.92	0.00 ^a		
15	Expected	2.00				2.00	2.00		2.00	2.00	3.00		1.00		1.00		2.00		
	Actual	2.12				2.00	2.13		2.06	2.05	3.29		1.12		1.02		0.00 ^a		
16	Expected	3.00		2.00		1.00	1.00		1.00	2.00	2.00		2.00	1.00	1.00	1.00	1.00		
	Actual	3.00		2.07		1.02	1.02		1.04	2.07	2.10		1.97	0.98	0.98	0.97	0.00 ^a		
17	Expected	2.00		3.00		2.00	1.00			1.00	1.00		2.00	2.00		2.00			2.00
	Actual	2.00		3.00		2.03	1.06			1.05	1.00		1.99	1.99		2.00			1.71
18	Expected	1.00	1.00	2.00	1.00	3.00	1.00				1.00		1.00	2.00		3.00			2.00
	Actual	0.99	1.07	1.92	0.00 ^a	3.00	1.01				1.07		1.12	2.21		2.81			1.33 ^p
19	Expected	1.00	1.00	2.00	1.00	3.00				1.00	1.00			1.00	1.00	2.00	1.00		1.00
	Actual	1.02	1.07	2.02	0.00 ^a	3.00				1.11	1.12			1.02	1.01	1.87	0.00 ^a		1.12
20	Expected	1.00	1.00	3.00		3.00	2.00			2.00			2.00		1.00	1.00	1.00		1.00
	Actual	1.00	0.99	2.98		3.06	2.14			2.10			1.97		1.01	0.94	0.00 ^a		1.20
21	Expected		1.00	1.00		2.00	2.00			3.00	1.00	1.00	3.00		1.00	2.00			1.00
	Actual		1.01	0.97		1.88	2.00			3.01	1.05	0.80	2.70		0.93	1.84			1.11
22	Expected		2.00	1.00		2.00	1.00			2.00	1.00	1.00	1.00		2.00	4.00			1.00
	Actual		1.82	1.12		2.00	1.03			1.96	1.07	1.20	1.05		2.09	3.48			0.80
23	Expected		1.00	2.00	1.00	2.00			2.00	1.00	2.00				2.00	2.00			1.00
	Actual		0.97	1.98	0.00 ^a	2.00			1.42 ^p	1.01	2.14				1.90	1.79			1.04
24	Expected	1.00		4.00	1.00	1.00	1.00			2.00	1.00	2.00				1.00	3.00		1.00
	Actual	1.00		4.08	0.00 ^a	1.01	0.97		1.33 ^p	1.01	2.03				0.95	2.62			1.06
25	Expected	2.00		3.00			1.00	1.00	3.00	2.00	1.00				2.00	1.00		1.00	1.00
	Actual	2.00		3.01			1.05	0.80	1.37 ^p	2.16	0.85				1.87	0.96		1.04	0.91
26	Expected	1.00	1.00	2.00		1.00		1.00	2.00	3.00					3.00		1.00	1.00	
	Actual	1.00	1.09	2.03		1.04		0.80	1.82	3.28					2.86		0.00 ^a	1.07	
27	Expected		2.00	3.00		2.00			1.00	3.00	1.00				2.00	1.00	2.00	1.00	
	Actual		2.12	2.72		2.00			0.87	2.99	1.03				1.69	0.90	0.00 ^a	0.97	
28	Expected	1.00	2.00	2.00		2.00	1.00			3.00	2.00					1.00	1.00		2.00
	Actual	1.00	2.03	1.85		1.96	1.06			2.72	1.87					0.91	0.00 ^a		1.71
29	Expected	1.00	1.00		1.00	3.00	1.00	1.00		2.00	1.00			1.00	1.00	2.00	1.00		2.00
	Actual	1.06	1.10		0.00 ^a	3.34	1.10	1.16		2.00	0.97			0.96	0.80	1.96	0.00 ^a		1.86
30	Expected			1.00		1.00	1.00	2.00	1.00	1.00	1.00			1.00	1.00	3.00	2.00		1.00
	Actual			0.97	0.00 ^a	1.20	2.11	1.15	1.00	2.00	0.90			1.15	0.80	2.83	0.00 ^a		0.97
31	Expected			2.00		1.00	2.00	1.00	3.00	3.00				1.00	1.00	2.00	1.00		1.00
	Actual			1.97		1.00	2.04	0.96	1.90 ^p	2.59				0.96	0.97	1.68	0.00 ^a		1.17
32	Expected	1.00	1.00	1.00		1.00	1.00			3.00	3.00			2.00	1.00	1.00			1.00
	Actual	1.00	0.98	0.92		0.87	1.06		1.80 ^p	2.48				1.62	1.04	0.85			1.03
33	Expected	1.00	3.00	2.00			1.00	1.00	2.00	1.00				2.00	1.00	1.00			1.00
	Actual	1.00	3.18	1.96			0.99	1.11	0.47 ^p	1.06				1.86	0.94	0.95			1.16
34	Expected	1.00	3.00	3.00		2.00	2.00				1.00			2.00	1.00	1.00		1.00	
	Actual	0.92	2.97	2.91		2.04	2.00	1.03			1.01			1.90	0.95	0.97		1.04	
35	Expected	3.00		2.00		3.00	3.00				1.00			2.00		1.00	1.00	1.00	1.00
	Actual	3.13		2.00		3.00	3.05				1.08			1.88		1.02	0.00 ^a	1.05	1.05
36	Expected		1.00	4.00		3.00	2.00		1.00				1.00	1.00			1.00	1.00	1.00
	Actual		0.97	3.82		3.00	2.00		1.11				0.97	0.91			0.00 ^a	1.09	1.09
37	Expected		1.00	2.00	1.00	2.00	2.00		1.00	1.00			1.00	1.00		3.00		1.00	2.00
	Actual		0.93	2.10	0.00 ^a	2.00	2.07		1.16	1.06			1.14	1.11		2.76		1.15	2.04
38	Expected		1.00	1.00	2.00	1.00	2.00	1.00		1.00				1.00	2.00	3.00		1.00	1.00
	Actual		0.91	1.00	0.00 ^a	1.03	2.00	0.94		1.12				0.96	1.42	2.59		1.20	0.95
39	Expected	1.00	2.00		1.00	1.00	2.00	1.00		1.00				1.00	2.00	2.00			1.00
	Actual	0.95	1.97		0.00 ^a	1.30	2.00	1.05		1.02				1.05	1.40	1.79			1.10
40	Expected	1.00	2.00		1.00	1.00	3.00	1.00		1.00	1.00			1.00	2.00	4.00			
	Actual	0.93	2.08		0.00 ^a	1.00	3.10	1.02		1.09	1.20			1.10	1.47	3.70			
41	Expected		2.00	1.00	2.00	1.00	1.00		1.00	1.00	1.00				1.00	5.00	1.00		
	Actual		1.88	0.95	0.00 ^a	1.02	1.00		0.97	0.94	1.04				0.97	4.73	0.00 ^a		
42	Expected		2.00	1.00	3.00		1.00		1.00	3.00	1.00			2.00	1.00	2.00	1.00		
	Actual		1.87	0.80	0.00 ^a		1.00		0.93	2.69	1.06			2.05	0.65	1.66	0.00 ^a		

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Table 2 - Amino Acid Analysis (continued)																			
Peptide		Ala (A)	Arg (R)	Asx (N,D)	Cys (C)	Glx (Q,E)	Gly (G)	His (H)	Ile (I)	Leu (L)	Lys (K)	Met (M)	Phe (F)	Pro (P)	Ser (S)	Thr (T)	Trp (W)	Tyr (Y)	Val (V)
43	Expected		2.00	1.00	3.00	1.00	1.00			2.00				2.00	2.00	2.00	1.00	1.00	
	Actual		1.82	0.98	0.00 ^a	0.94	1.00			1.98				2.23	1.78	1.84	0.00 ^a	0.96	
44	Expected		2.00	1.00	1.00	2.00	2.00		1.00	1.00		1.00			1.00	1.00	1.00	2.00	
	Actual		1.67	1.01	0.00 ^a	2.00	2.17		0.80	0.87		1.16			0.96	0.94	0.00 ^a	2.12	
45	Expected		2.00	1.00	1.00	3.00	2.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
	Actual		1.70	1.04	0.00 ^a	3.00	2.04	1.05	0.80		1.02	1.14		1.19	0.80		0.00 ^a	1.06	
46	Expected	1.00	2.00	2.00		5.00		1.00	1.00	1.00	1.00			1.00	1.00	1.00			2.00
	Actual	1.00	2.24	2.20		5.42		1.00	1.00	0.98	1.03			1.00	0.91	0.97			2.23

^aCys and/or Trp were completely destroyed during hydrolysis

^bIle-Ile, Val-Val-Val and/or Val-Val bond were only partially destroyed during hydrolysis.

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Date: 23 JUL 2014

Signature: *Dorothy C. Young*

Title: Technical Manager, BEI Authentication

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