Certificate of Analysis for NR-4057

Peptide Arrays, HLA Supertype A and B, Epitopes of Vaccinia Virus Proteins

Catalog No. NR-4057

This reagent is the tangible property of the U.S. Government.

Product Description: NR-4057 contains six peptide arrays. The first peptide array (NRC-415; 12 peptides) consists of HLA supertype A1 epitopes of the vaccinia virus proteins: C19L, C10L, C10L, C12L, VWR050, D1R, D12L, B8R, B8R, B8R variant, B8R, and C19L. The second peptide array (NRC-416; 34 peptides) consists of HLA supertype A2 epitopes of the vaccinia virus proteins: C7L, N2L, F12L, F12L, VACWR082, E2L, E9L, O1L, I4L, A6L, D3R, A26L, A36R, A36R variant, A55R, A14L, I1L, A46R, A17L, H3L, B14R, B14R variant, A6L, D12L, G7L, VACWR050, M1L, A17L, B6R, VETFsm, A26L, A26L variant, B22R & C16L, and B22R & C16L variant. The third peptide array (NRC-417; 17 peptides) consists of HLA supertype A3 epitopes of the vaccinia virus proteins: C12L, C9L, C7L, C5L, I3L, G8R, J6R, D1R, D5R, D5R variant, A8R, A31R, A31R variant, A31R variant, B5R, B14R, and B14R variant. The fourth peptide array (NRC-418; 5 peptides) consists of HLA supertype A24 epitopes of the vaccinia virus proteins: D5R, D5R, D5R variant, C6L, and C6L variant. The fifth peptide array (NRC-419; 8 peptides) consists of HLA supertype B7 epitopes of the vaccinia virus proteins: C1L, C1L variant, F4L, F4L variant, O1L, J6R, D1R, and D1R variant. The sixth peptide array (NRC-420; 6 peptides) consists of HLA supertype B44 epitopes of the vaccinia virus proteins: C3L, C3L variant, C3L variant, G2R, G2R variant, and B8R. Peptides are 9- to 10-mers. Please see Table 1 for length and sequence of individual peptides.

Lot: P97019A

The following information applies to all peptides:

• Appearance	White lyophilized powder
• Mass spectral analysis	Correct MW by MALDI-TOF
• Counter Ion	Trifluoroacetate

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

Table 1

Protein	Date of Mfg.	Length	Sequence	MW (amu)	Hydrophilicity	Purity by HPLC[1]	Peptide Content[2]	Viruses with Identical Peptide Sequence
NRC-415: Vaccinia HLA Supertype A1 Epitopes								
C19L	10/4/2006	10	29-VSVNNVCHMY-38	1165	-0.9	95.8	81.25	DryVax[a], VARV-BSH, VACV-COP, VACV-WR
C10L	10/18/2006	9	297-SQSDTVFDY-305	1061	0	99.0	79.76	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
C10L	11/7/2006	9	298-QSDTVFDYY-306	1137	-0.3	98.3	83.69	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
C12L	9/29/2006	10	97-VTDTNKFDNY-106	1216	0.2	95.7	86.76	DryVax[a]
VWR050	11/6/2006	9	259-CMLTEFLHY-267	1156	-1	>95.0	82.66	DryVax[a]
D1R	9/29/2006	9	156-FTIDFKLKY-164	1174	-0.3	>95.0	77.34	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
D12L	9/28/2006	9	11-GTHVLLPFY-19	1046	-1.2	98.2	75.60	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
B8R	11/21/2006	9	139-DMCDIYLLY-147	1148	-0.7	>95.0	79.95	DryVax[a], VARV-BSH, VACV-COP, VACV-WR
B8R	9/29/2006	10	153-FGDSKEPVPY-162	1138	0.3	98.6	73.59	DryVax[a], VACV-WR
B8R; Variant	10/2/2006	10	153-FGDSEEPVTY-162	1143	0.3	97.0	74.29	Variant for VARV-BSH , VACV-COP
B8R	10/2/2006	10	262-FLSMLNLTKY-271	1230	-0.8	97.8	88.42	DryVax[a], VACV-COP
C19L	11/7/2006	9	104-QSITRSLIY-112	1080	-0.5	98.7	65.38	DryVax[a]

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Table 1

Protein	Date of Mfg.	Length	Sequence	MW (amu)	Hydrophilicity	Purity by HPLC[1]	Peptide Content[2]	Viruses with Identical Peptide Sequence
NRC-416: Vaccinia HLA Supertype A2 Epitopes								
C7L	9/22/2006	9	74-KVDDTFYYV-82	1149	-0.2	97.4	80.84	DryVax[a], VACV-WR[b], VARV-BSH[c], VACV-COP, VACV-MVA
N2L	10/4/2006	9	93-YVNAILYQI-101	1096	-1.3	96.1	72.10	DryVax[a]
F12L	9/25/2006	10	286-NLFDIPLLTV-295	1144	-0.8	95.7	73.85	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
F12L	9/28/2006	9	404-FLTSVINRV-412	1048	-0.7	97.3	66.64	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
VACWR082	9/27/2006	9	18-ILDDNLYKV-26	1092	0	>95.0	91.37	DryVax[a], VACV-WR[b]
E2L	9/25/2006	9	249-KIDYYIPYV-257	1173	-0.7	97.5	74.79	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
E9L	10/2/2006	9	107-FLNISWFYI-115	1202	-1.7	>95.0	79.77	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
O1L	9/29/2006	9	247-GLNDYLHSV-255	1017	0.5	96.6	77.08	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
I4L	11/1/2006	9	720-SMHFYGWSL-728	1127	-1.2	95.6	68.86	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
A6L	9/26/2006	9	172-ILSDENYLL-180	1079	-0.3	99.1	79.77	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
D3R	11/22/2006	9	342-FLVIAINAM-350	991	-1.3	91.2	70.4	DryVax[a]
A26L	9/26/2006	10	177-YLYTEYFLFI-186	1372	-1.5	95.5	86.10	DryVax[a]
A36R	10/2/2006	9	1-MMLVPLITV-9	1016	-1.3	98.0	74.36	DryVax[a], VACV-COP, VACV-WR, VACV-MVA
A36R; Variant	10/4/2006	9	1-MILVPLITV-9	998	-1.3	99.9	84.05	Variant for VARV-BSH
A55R	11/6/2006	9	78-YIYGIPLSL-86	1038	-1.3	95.8	84.43	DryVax[a], VACV-COP, VACV-WR
A14L	11/22/2006	9	51-FILGIIITV-59	988	-1.5	23.9	44.2	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
I1L	11/9/2006	9	211-RLYDYFTRV-219	1232	-0.2	>95.0	82.97	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
A46R	9/29/2006	9	142-GLFDFVNFV-150	1057	-1	>95.0	79.46	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
A17L	10/10/2006	10	61-RTLLGLILFV-70	1144	-1	97.4	81.86	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
H3L	9/29/2006	9	184-SLSAYIIRV-192	1021	-0.7	95.5	79.25	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
B14R	10/3/2006	9	327-HVDGKILFV-335	1027	-0.4	96.8	81.85	VACV-WR[b], VARV-BSH, VACV-COP
B14R; Variant	11/7/2006	10	354-HDITGFILFM-363	1193	-1	98.6	78.11	Variant for VACV-MVA
A6L	9/29/2006	9	6-VLYDEFVTI-14	1098	-0.6	>95.0	89.00	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
D12L	9/29/2006	9	251-RVYEALYYV-259	1175	-0.7	99.7	73.22	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
G7L	10/4/2006	9	250-YLPEVISTI-258	1034	-0.7	97.6	85.66	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
VACWR050	10/23/2006	9	196-FLIVSLCPT-204	992	-1.2	>95.0	77.37	VACV-WR[b]
M1L	9/29/2006	10	374-IIIPFIAYFV-383	1196	-1.6	99.0	56.71	VACV-WR[b], VARV-BSH, VACV-COP
A17L	11/22/2006	10	81-ILMIFISSFL-90	1184	-1.5	>80.0	70.58	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
B6R	9/29/2006	9	108-LMYDIINSV-116	1067	-0.8	99.8	79.08	VACV-WR[b], VARV-BSH, VACV-COP, VACV-MVA
VETFsm	11/8/2006	9	498-VLPFDIKKL-506	1072	0	99.8	67.1	VACV-WR[c]
A26L	10/27/2006	9	6-NLWNGIVPT-14	1013	-0.9	99.8	86.96	VACV-WR[c], VACV-COP, VACV-MVA
A26L; Variant	11/13/2006	9	6-NLWNGIVPM-14	1043	-1	97.9	73.41	Variant for VARV-BSH[c]
B22R , C16L	11/22/2006	9	60-CLTEYILWV-68	1139	-1.2	64.2	90.6	VARV-BSH[d], VACV-COP[d], VACV-MVA[d],
B22R , C16L;	11/22/2006	9	60-CLTEYIYWS-68	1177	-1.1	56.2	80.0	Variant for VARV-BSH, VACV-WR, VACV-MVA
NRC-417: Vaccinia HLA Supertype A3 Epitopes								
C12L	9/29/2006	10	93-KVLHVTDTNK-102	1154	0.3	99.5	68.26	DryVax[a]
C9L	10/2/2006	9	193-ATSLDVINY-201	995	-0.5	99.8	68.47	DryVax[a], VACV-COP, VACV-WR
C7L	9/28/2006	10	31-KLKIISNDYK-40	1222	0.5	97.4	77.38	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
C5L	9/25/2006	9	158-KVMFVIRFK-166	1168	-0.2	98.9	64.56	DryVax[a], VACV-COP, VACV-WR
I3L	9/25/2006	9	116-AVYGNIKHK-124	1029	0	97.8	53.67	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
G8R	9/25/2006	9	65-IVFNLPVSK-73	1016	-0.6	99.7	81.84	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
J6R	9/26/2006	9	332-NQVKFYFNK-340	1187	-0.2	>95.0	67.01	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
D1R	9/29/2006	10	152-KTKNFTIDFK-161	1241	0.5	95.6	75.50	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
D5R	10/2/2006	9	670-YLLVKWYRK-678	1269	-0.5	99.0	66.10	DryVax[a], VARV-BSH, VACV-WR
D5R; Variant	9/28/2006	9	670-YLLVKWYKK-678	1241	-0.5	95.7	60.81	Variant for VACV-COP, VACV-MVA
A8R	10/9/2006	10	79-AVKDVTITKK-88	1102	0.6	98.5	77.69	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
A31R	9/29/2006	9	86-VTSSGAIYK-94	925	-0.3	>95.0	70.33	DryVax[a], VACV-WR
A31R; Variant	9/29/2006	9	86-VTSSGVIYK-94	953	-0.4	95.8	75.94	Variant for VARV-BSH, VACV-COP
A31R; Variant	9/29/2006	9	86-VTSSGTIYK-94	955	-0.3	>95.0	76.18	Variant for VACV-MVA
B5R	11/14/2006	10	154-GTIAGGVCYY-163	1003	-1	>95.0	75.38	DryVax[a]
B14R	9/26/2006	10	74-AVFKDSFLRK-83	1210	0.4	>95.0	80.24	DryVax[a], VACV-WR
B14R; Variant	9/26/2006	10	74-AVFKNSFLGK-83	1110	-0.2	98.3	92.59	Variant for VARV-BSH
NRC-418: Vaccinia HLA Supertype A24 Epitopes								
D5R	9/29/2006	9	349-VWINNSWKF-357	1193	-1	95.4	92.89	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
D5R	9/28/2006	10	663-RYRFAFLYLI-672	1362	-0.9	99.9	81.51	DryVax[a]
D5R; Variant	9/29/2006	10	663-RYRFAFLYLL-672	1362	-0.9	99.2	68.79	Variant for VACV-COP, VACV-MVA, VACV-WR ,VARV-BSH
C6L	9/28/2006	9	54-RYYDGNIYE-63	1192	0.1	97.4	73.18	DryVax[a], VACV-WR
C6L; Variant	9/29/2006	9	54-RYYDGNIYD-63	1178	0.1	97.9	85.02	Variant for VARV-BSH, VACV-MVA, VACV-COP

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Table 1

Protein	Date of Mfg.	Length	Sequence	MW (amu)	Hydrophilicity	Purity by HPLC[1]	Peptide Content[2]	Viruses with Identical Peptide Sequence
NRC-419: Vaccinia HLA Supertype B7 Epitopes								
C1L	11/1/2006	10	102-KPKPAVRFAI-111	1126	0.2	97.5	63.45	DryVax[a], VACV-COP, VACV-WR
C1L; Variant	9/29/2006	10	102-KPKPAVRYAI-111	1142	0.2	97.5	62.65	Variant for VARV-BSH
F4L	9/25/2006	9	6-APNPNRFVI-14	1027	-0.3	99.8	76.09	DryVax[a], VACV-COP, VACV-WR, VACV-MVA
F4L; Variant	9/26/2006	9	6-AKNPNRFVI-14	1058	0	99.9	82.66	Variant for VARV-BSH
O1L	10/3/2006	10	335-RPMSLRSTII-344	1173	-0.1	97.3	60.48	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
J6R	9/28/2006	9	303-MPAYIRNTL-311	1078	-0.5	>95.0	83.56	DryVax[a], VARV-BSH, VACV-COP, VACV-WR, VACV-MVA
D1R	10/9/2006	9	686-HPRHYATVM-694	1111	-0.4	99.0	52.08	DryVax[a], VACV-COP, VACV-WR, VACV-MVA
D1R; Variant	10/2/2006	9	686-HPRHYATIM-694	1125	-0.5	95.1	60.57	Variant for VARV-BSH
NRC-420: Vaccinia HLA Supertype B44 Epitopes								
C3L	9/29/2006	9	120-GESKSYCEL-128	1015	0.5	99.2	73.63	DryVax[a], VACV-COP, VACV-WR
C3L; Variant	9/28/2006	9	120-GEYKSYCKL-128	1090	0.2	>95.0	70.82	Variant for VARV-BSH
C3L; Variant	9/29/2006	9	120-GETKYFRCE-128	1132	0.6	97.8	67.45	Variant for VACV-MVA
G2R	9/29/2006	9	181-DELVDPINY-189	1077	0.2	>95.0	91.92	DryVax[a], VACV-COP, VACV-WR, VACV-MVA
G2R; Variant	9/29/2006	9	181-DKLVDPINY-189	1076	0.2	95.2	78.25	Variant for VARV-BSH
B8R	9/28/2006	9	110-TEYDDHINL-118	1119	0.3	98.4	85.83	DryVax[a], VARV-BSH, VACV-COP, VACV-WR

[1]% full-length.
[2]%; remainder is salt and water.

References:

[a]Oseroff, C., et al. Proc. Natl. Acad. Sci. U.S.A. 102 (2005): 13980-13985. PubMed: 16172378.
[b]Pasquetto, V., et al. J. Immunol. 175 (2005): 5504-5515. PubMed: 16210659.
[c]Snyder, J., et al. J. Virol. 78 (2004): 7052-7060. PubMed: 15194781.
[d]Terajima, M., et al. J. Exp. Med. 197 (2003): 927-932. PubMed: 12668642.

Abbreviations:
VARV-BSH: Variola Virus, Bangladesh
VACV-COP: Vaccinia Virus, Copenhagen
VACV-WR: Vaccinia Virus, Western Reserve
VACV-MVA: Vaccinia Virus, Modified Vaccinia Virus Ankara

Table 2 - Amino Acid Analysis

		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)
NRC-415: Vaccinia HLA Supertype A1 Epitopes																			
C19L	Expected			2.00	1.00			1.00				1.00		0.00	1.00			1.00	3.00
	Actual			1.70	0.00[a]			0.93				1.05		0.64[a]	0.82			1.10	3.20
C10L	Expected			2.00		1.00							1.00		2.00	1.00		1.00	1.00
	Actual			2.12		0.92							1.07		1.80	0.96		1.07	1.12
C10L	Expected			2.00		1.00							1.00		1.00	1.00		2.00	1.00
	Actual			2.12		0.96							1.03		0.99	0.98		1.99	1.08
C12L	Expected			4.00							1.00		1.00			2.00		1.00	1.00
	Actual			3.74							0.99		1.06			1.95		1.04	1.05
VWR050	Expected				1.00	1.00		1.00		2.00		1.00	1.00	0.00		1.00		1.00	
	Actual				0.00[a]	0.94		1.00		2.00		1.01	1.09	0.61[a]		0.98		1.03	
D1R	Expected			1.00					1.00	1.00	2.00		2.00			1.00		1.00	
	Actual			1.01					1.00	1.01	2.10		2.02			1.07		0.91	
D12L	Expected						1.00	1.00		2.00			1.00	1.00		1.00		1.00	1.00
	Actual						0.97	0.97		1.92			1.03	1.00		1.04		1.03	1.05
B8R	Expected			2.00	1.00				1.00	2.00		1.00		0.00				2.00	
	Actual			2.12	0.00[a]				0.93	2.06		1.00		0.54[a]				1.98	
B8R	Expected			1.00		1.00	1.00				1.00		1.00	2.00	1.00			1.00	1.00
	Actual			0.93		0.92	0.96				1.00		1.05	1.97	0.81			1.05	1.10
B8R; Variant	Expected			1.00		2.00	1.00						1.00	1.00	1.00	1.00		1.00	1.00
	Actual			0.94		1.87	0.96						1.08	1.07	0.92	0.95		1.09	1.14
B8R	Expected			1.00						3.00	1.00	1.00	1.00		1.00	1.00		1.00	
	Actual			0.95						3.15	0.99	0.65[b]	1.10		0.94	0.97		1.09	
C19L	Expected		1.00			1.00			2.00	1.00					2.00	1.00		1.00	
	Actual		1.12			0.82			2.04	1.07					1.79	0.93		1.06	
NRC-416: Vaccinia HLA Supertype A2 Epitopes																			
C7L	Expected			2.00							1.00		1.00			1.00		2.00	2.00
	Actual			1.81							1.03		1.05			0.99		2.01	2.12
N2L	Expected	1.00		1.00		1.00			2.00	1.00								2.00	1.00
	Actual	0.97		0.93		0.94			2.04	1.05								2.04	1.08
F12L	Expected			2.00					1.00	3.00			1.00	1.00		1.00			1.00
	Actual			1.97					0.92	3.05			1.02	0.95		1.06			1.11
F12L	Expected		1.00	1.00					1.00	1.00			1.00		1.00	1.00			2.00
	Actual		1.01	0.98					0.75[c]	1.10			1.16		1.03	1.03			1.90

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Table 2 - Amino Acid Analysis																			
		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)
NRC-416: Vaccinia HLA Supertype A2 Epitopes																			
VACWR082	Expected			3.00					1.00	2.00	1.00							1.00	1.00
	Actual			3.09					0.95	2.08	0.86							1.02	1.10
E2L	Expected			1.00					2.00		1.00			1.00				3.00	1.00
	Actual			0.94					1.95		1.02			1.02				2.91	1.08
E9L	Expected			1.00					2.00	1.00			2.00		1.00		1.00	1.00	
	Actual			0.94					2.04	1.08			2.15		0.90		0.00[d]	1.05	
O1L	Expected			2.00			1.00	1.00		2.00					1.00			1.00	1.00
	Actual			1.90			0.97	0.99		1.92					0.85			1.03	1.11
I4L	Expected						1.00	1.00		1.00		1.00	1.00		2.00		1.00	1.00	
	Actual						0.93	0.96		1.02		0.7[b]	1.05		1.57[e]		0.00[d]	1.05	
A6L	Expected			2.00		1.00			1.00	3.00					1.00			1.00	
	Actual			2.06		1.05			0.96	3.11					0.93			1.04	
D3R	Expected	2.00		1.00					2.00	1.00		1.00	1.00						1.00
	Actual	2.21		1.23[f]					2.04	0.98		1.25[f]	0.78[f]						0.90
A26L	Expected					1.00			1.00	2.00			2.00			1.00		3.00	
	Actual					1.04			0.95	1.97			2.01			1.12		2.86	
A36R	Expected								1.00	2.00		2.00		1.00		1.00			2.00
	Actual								0.96	2.00		2.00		1.05		1.00			2.10
A36R; Variant	Expected								2.00	2.00		1.00		1.00		1.00			2.00
	Actual								2.02	2.12		0.66[b]		0.97		1.01			2.23
A55R	Expected						1.00		2.00	2.00				1.00	1.00			2.00	
	Actual						1.02		2.05	2.17				0.94	0.89			2.14	
A14L	Expected						1.00		4.00	1.00			1.00			1.00			1.00
	Actual						1.4[f]		3.51	1.00			0.68[f]			1.55[f]			1.60[f]
I1L	Expected		2.00	1.00						1.00			1.00			1.00		2.00	1.00
	Actual		1.77	1.03						0.98			0.99			1.12		1.91	1.10
A46R	Expected			2.00			1.00			1.00			3.00						2.00
	Actual			1.85			0.98			1.00			3.07						2.16
A17L	Expected		1.00				1.00		1.00	4.00			1.00			1.00			1.00
	Actual		1.05				0.95		0.90	3.99			1.03			1.02			1.10
H3L	Expected	1.00	1.00						2.00	1.00					2.00			1.00	1.00
	Actual	1.02	0.99						1.69	1.07					1.79			1.07	1.17
B14R	Expected			1.00			1.00	1.00	1.00	1.00	1.00		1.00						2.00
	Actual			1.04			1.01	0.90	0.98	1.04	0.90		1.06						2.16
B14R; Variant	Expected			1.00			1.00	1.00	2.00	1.00		1.00	2.00			1.00			
	Actual			1.03			1.03	1.06	1.92	0.94		0.98	1.95			1.09			
A6L	Expected			1.00		1.00			1.00	1.00			1.00			1.00		1.00	2.00
	Actual			0.94		0.97			0.99	1.00			1.06			1.01		1.02	2.13
D12L	Expected	1.00	1.00			1.00				1.00								3.00	2.00
	Actual	1.00	0.93			0.98				1.01								3.05	2.12
G7L	Expected					1.00			2.00	1.00				1.00	1.00	1.00		1.00	1.00
	Actual					1.00			1.96	1.13				1.02	0.93	0.94		1.12	0.97
VACWR050	Expected				1.00				1.00	2.00			1.00	1.00	1.00	1.00			1.00
	Actual				0.00[a]				0.73[c]	2.11			1.06	1.64[a]	0.99	1.00			0.84
M1L	Expected	1.00							4.00				2.00	1.00				1.00	1.00
	Actual	0.97							3.55				1.93	1.07				1.04	1.06
A17L	Expected								3.00	2.00		1.00	2.00		2.00				
	Actual								2.69	2.08		0.79[b]	2.12		2.11				
B6R	Expected			2.00					2.00	1.00		1.00			1.00			1.00	1.00
	Actual			2.18					1.73	1.24[h]		0.59[b]			0.96			1.27[h]	1.32[h]
VETFsm	Expected			1.00					1.00	2.00	2.00		1.00	1.00			1.00		
	Actual			1.06					0.91	1.91	1.91		1.03	1.23[g]			1.10		
A26L	Expected			2.00			1.00		1.00	1.00				1.00		1.00	1.00		1.00
	Actual			2.16			1.02		0.77[c]	1.08				0.92		1.07	0.00[d]		0.89
A26L; Variant	Expected			2.00			1.00		1.00	1.00		1.00		1.00			1.00		1.00
	Actual			2.09			0.99		0.78[c]	1.05		1.06		0.95			0.00[d]		0.90
B22R & C16L	Expected					1.00			1.00	2.00						1.00		1.00	1.00
	Actual					1.01			0.92	1.96						1.09		0.97	1.09
B22R & C16L;	Expected				1.00	1.00			1.00	1.00				0.00	1.00	1.00	1.00	2.00	
	Actual				0.00[a]	1.05			0.98	0.98				0.59[a]	1.07	1.01	0.00[d]	2.02	

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Table 2 - Amino Acid Analysis

		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)
NRC-417: Vaccinia HLA Supertype A3 Epitopes																			
C12L	Expected			2.00				1.00		1.00	2.00					2.00			2.00
	Actual			1.89				0.94		1.04	1.98					2.07			2.20
C9L	Expected	1.00		2.00					1.00	1.00					1.00	1.00		1.00	1.00
	Actual	1.07		2.06					0.89	1.09					0.99	1.05		1.19	0.99
C7L	Expected			2.00					2.00	1.00	3.00				1.00			1.00	
	Actual			2.15					1.58[c]	1.08	2.77				0.91			1.06	
C5L	Expected		1.00						1.00		2.00	1.00	2.00						2.00
	Actual		1.00						0.79[c]		1.95	1.00	2.06						1.99
I3L	Expected	1.00		1.00			1.00	1.00	1.00		2.00							1.00	1.00
	Actual	1.04		0.94			1.00	0.98	0.97		1.88							1.03	1.10
G8R	Expected			1.00					1.00	1.00	1.00		1.00	1.00	1.00				2.00
	Actual			1.03					0.70[c]	1.03	1.04		1.05	0.99	0.92				1.98
J6R	Expected			2.00		1.00					2.00		2.00					1.00	1.00
	Actual			1.92		1.00					1.97		1.98					1.00	1.08
D1R	Expected			2.00					1.00		3.00		2.00			2.00			
	Actual			1.87					1.03		3.01		2.12			2.04			
D5R	Expected		1.00							2.00	2.00						1.00	2.00	1.00
	Actual		0.89							2.03	1.89						0.00[d]	2.13	1.08
D5R; Variant	Expected									2.00	3.00						1.00	2.00	1.00
	Actual									1.95	2.89						0.00[d]	2.01	1.06
A8R	Expected	1.00		1.00					1.00		3.00					2.00			2.00
	Actual	1.08		0.97					0.95		2.98					2.05			2.05
A31R	Expected	1.00					1.00		1.00		1.00				2.00	1.00		1.00	1.00
	Actual	1.00					1.00		1.02		1.03				1.85	0.94		1.03	1.15
A31R; Variant	Expected						1.00		1.00		1.00				2.00	1.00		1.00	2.00
	Actual						1.04		0.80		1.14				1.86	0.97		1.13	2.03
A31R; Variant	Expected						1.00		1.00		1.00				2.00	2.00		1.00	1.00
	Actual						0.97		1.03		1.02				1.93	1.90		1.04	1.12
B5R	Expected	1.00			1.00		3.00		1.00					0.00		1.00		2.00	1.00
	Actual	0.94			0.00[a]		2.87		0.99					0.62[a]		0.97		2.10	1.14
B14R	Expected	1.00	1.00	1.00						1.00	2.00		2.00		1.00				1.00
	Actual	1.04	1.03	1.01						0.97	1.98		1.98		0.92				1.09
B14R; Variant	Expected	1.00		1.00			1.00			1.00	2.00		2.00		1.00				1.00
	Actual	1.02		0.98			1.00			0.94	1.96		1.98		0.87				1.08
NRC-418: Vaccinia HLA Supertype A24 Epitopes																			
D5R	Expected			2.00					1.00		1.00		1.00		1.00		2.00		1.00
	Actual			1.84					1.00		1.00		1.05		0.84		0.00[d]		1.04
D5R	Expected	1.00	2.00						1.00	2.00			2.00					2.00	
	Actual	1.08	2.07						0.95	1.91			1.99					1.98	
D5R; Variant	Expected	1.00	2.00							3.00			2.00					2.00	
	Actual	0.99	1.97							2.96			2.03					2.04	
C6L	Expected		1.00	2.00		1.00	1.00		1.00									3.00	
	Actual		0.97	1.89		1.01	1.00		1.04									3.11	
C6L; Variant	Expected		1.00	3.00			1.00		1.00									3.00	
	Actual		0.95	2.93			0.97		1.04									3.19	
NRC-419: Vaccinia HLA Supertype B7 Epitopes																			
C1L	Expected	2.00	1.00						1.00		2.00		1.00	2.00					1.00
	Actual	2.04	0.93						1.00		1.94		1.02	1.89					1.12
C1L; Variant	Expected	2.00	1.00						1.00		2.00			2.00				1.00	1.00
	Actual	1.90	0.90						1.04		1.99			2.00				1.05	1.07
F4L	Expected	1.00	1.00	2.00					1.00				1.00	2.00					1.00
	Actual	0.97	1.10	1.88					0.89				1.10	2.05					0.98
F4L; Variant	Expected	1.00	1.00	2.00					1.00		1.00		1.00	1.00					1.00
	Actual	1.08	1.04	1.92					0.86		1.03		1.04	1.02					0.97
O1L	Expected		2.00						2.00	1.00		1.00		1.00	2.00	1.00			
	Actual		2.15						1.77	1.12		1.08		1.03	1.86	0.98			
J6R	Expected	1.00	1.00	1.00					1.00	1.00		1.00		1.00		1.00		1.00	
	Actual	0.99	0.96	0.95					0.95	1.05		0.5[b]		1.06		1.04		1.04	
D1R	Expected	1.00	1.00					2.00				1.00		1.00		1.00		1.00	1.00
	Actual	1.00	0.89					1.87				0.78		1.01		1.04		1.10	1.07
D1R; Variant	Expected	1.00	1.00					2.00	1.00			1.00		1.00		1.00		1.00	
	Actual	0.93	1.05					2.02	1.02			1.03		0.95		0.99		1.05	

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Table 2 - Amino Acid Analysis

		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)
NRC-420: Vaccinia HLA Supertype B44 Epitopes																			
C3L	Expected				1.00	2.00	1.00			1.00	1.00			0.00	2.00			1.00	
	Actual				0.00[a]	1.86	0.95			1.04	0.97			0.64[a]	1.60			1.10	
C3L; Variant	Expected				1.00	1.00	1.00			1.00	2.00			0.00	1.00			2.00	
	Actual				0.00[a]	1.02	1.00			1.03	2.02			0.56[a]	0.95			2.09	
C3L; Variant	Expected		1.00		1.00	2.00	1.00				1.00		1.00	0.00		1.00		1.00	
	Actual		0.97		0.00[a]	1.92	1.00				1.01		1.03	0.67[a]		1.05		1.02	
G2R	Expected			3.00		1.00			1.00	1.00				1.00				1.00	1.00
	Actual			2.65		0.96			0.98	1.00				1.08				1.03	1.07
G2R; Variant	Expected			3.00					1.00	1.00	1.00			1.00				1.00	1.00
	Actual			2.64					0.98	1.02	0.97			1.05				1.02	1.08
B8R	Expected			3.00		1.00		1.00	1.00	1.00						1.00		1.00	
	Actual			2.85		0.99		0.98	0.97	1.06						1.05		1.08	

[a]Cys degredation products co-elute with Pro.
[b]Met partially destroyed due to oxidation.
[c]Val:Ile, Val:Val, Ile:Ile, Ile:Val bonds are only partially cleaved in the 22-hour hydrolysis.
[d]Trp completely destroyed during hydrolysis.
[e]Ser and Thr partially destroyed during hydrolysis. *p*-Ser and *p*-Thr destroyed at a higher rate.
[f]Target purity, Table 1, low due to hydrophobic nature of sequence (hydolysis difficult due to hydrophobic nature of sequence).
[g]Baseline was too high in this measurement. Upon correction of the baseline, the Pro reading was 1.03. All other readings remained within the acceptable range.
[h]Incomplete hydrolysis due to Ile:Ile, Ile:Val bonds (hydolysis difficult due to hydrophobic nature of sequence).

Date: 23 FEB 2007

Signature: Signature on File

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