





Table S4. Conservancy analysis of T cell linear epitope sequences

No.	Sequence	Influenza Source Subtype	Source Protein	MHC Restriction Allele(s)	Host Species	H1N1							H3N2							H5N1		
						A/Brevig Mission/118	A/New Caledonia/2089	A/PR/8/34	A/Taiwan/1/86	A/Texas/36/91	A/USSR/9/0/77	A/W5/33	A/Bangkok/1/79	A/Beijing/3/53/89	A/England/4/72	A/Hong Kong/1/68	A/Leningrad/56/86	A/New York/5/2004	A/Panama/2007/99	A/ODRN/30/72	A/Hong Kong/156/97	A/Viet Nam/1194/2004
144	IYSTVASSLVL	H1N1	HA	H-2-KD;HLA-B37	MOUSE	36	100	100	100	100	100	100	55	55	55	55	55	55	55	55	91	91
145	IYWTVKPGDILLINS	H3N2	HA	HLA-DRB1*0101;HLA-DRB1*0701	HUMAN	38	38	44	38	38	38	38	100	100	94	88	100	100	100	94	44	44
146	IYWTVKPGDILLINSTGNLIAPRGYFKIRN	H3N2	HA		HUMAN	45	42	48	42	42	42	45	94	97	87	84	97	97	97	87	45	45
147	KEIGNGCFEF	H1N1	HA	H-2-DB;MAMU-A*11		40	100	100	100	100	100	100	50	50	40	50	50	50	50	50	90	90
148	KEVNARIEPFLKTP	H3N2	PA		MOUSE	100	100	100	100	100	100	93	93	93	100	93	93	93	93	100	100	100
149	KFLMLDALKLSIEDP	H3N2	PA		MOUSE	100	93	100	100	93	100	100	100	100	100	100	100	100	100	100	100	100
150	KGEIRRIWROANNNG	H3N2	NP		HUMAN	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93
151	KGILGFVFTLTV	H1N1;H2N2	M1	HLA-A*02;HLA-A*0201;HLA-A2	HUMAN;MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
152	KGVELKSGYKDWLWISFAISCFLLCVVL LGFIM	H3N2	HA		HUMAN	24	35	35	35	35	35	35	100	100	26	100	100	97	100	100	24	24
153	KIDLWSYNAELLVALE	H3N2	HA	HLA-DRB1*0101;HLA-DRB1*0701;HLA-DRB1*1302;HLA-DRB1*1501	HUMAN	31	69	69	69	69	69	69	100	100	31	100	100	94	100	100	63	63
154	KIDLWSYNAELLVALENGHTI	H3N2	HA	HLA-DR	HUMAN	24	62	62	62	62	62	62	100	100	29	100	95	95	100	100	57	57
155	KIYHKCDNACIGSIRN	H3N2	HA	HLA-DRB1*0701	HUMAN	38	50	63	50	50	50	63	100	100	31	94	100	100	100	100	56	63
156	KLKNSYVKKKGG	H1N1	HA	H-2-IED	MOUSE	75	58	100	58	58	58	83	42	50	42	42	50	50	50	42	42	42
157	KLSTRGVQIASNEN	H1N1	NP		HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	93	93
158	KONTKLATGMRNVP	H3N2	HA		MOUSE	47	40	40	40	40	40	40	100	100	100	100	100	100	100	100	67	67
159	KQYDSEPELRSLAS	H3N2	PA		MOUSE	100	87	100	93	93	93	100	93	93	93	93	93	93	93	93	93	87
160	KRMGVQMQR	H7N1	M1	HLA-DP	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
161	KRYGPALSI	H3N2	PB2	HLA-B*27052;KB	MOUSE	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	100	100
162	KTGGPIYKR	H3N2	NP	HLA-A68;HLA-AW68	HUMAN	89	100	89	100	100	100	89	89	100	100	100	100	100	89	100	89	89
163	KTGGPIYRRVNGKWM	H3N2	NP		MOUSE	87	80	100	87	80	87	87	93	87	87	87	87	80	93	87	80	80
164	KYVKONTLKL	H3N2	HA	H-2-IED	MOUSE	50	50	50	50	50	50	50	100	90	100	100	90	90	90	100	70	70
165	LEFINEDFNWTGVAQDGGSYACKRGVSNF	H3N2	HA		HUMAN	23	23	23	23	23	23	23	87	90	73	67	87	67	73	67	27	27
166	LEFITEGFTWGTQNGGNSNA	H3N2	HA	H-2-IAK	MOUSE	29	29	29	29	29	29	29	81	67	95	100	76	71	67	95	29	29
167	LEFITEGFTWGTQNGGNSNAC	H3N2	HA	H-2-IAK	MOUSE	27	32	27	27	32	27	27	82	68	95	100	77	73	68	95	27	27
168	LELRSRYWA		NP	HLA-B44		100	100	100	100	100	100	100	100	100	100	100	100	89	89	100	100	100
169	LELRSRYWAI		NP	HLA-B44		100	100	100	100	100	100	100	100	100	100	100	90	90	100	100	100	100
170	LELRSRYWAIRTRSGGNQQRAS	H3N2	NP	H-2-D CLASS II;HLA-DR4	HUMAN;MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	96	96	100	100	100
171	LENFRAYVDGFEPTNG	H3N2	PA		MOUSE	100	93	100	100	100	100	100	100	100	100	100	100	100	100	100	93	100
172	LENLOAYQKR	H7N1	M1	HLA-DQ	HUMAN	90	100	100	100	100	100	100	90	90	100	100	90	90	90	100	90	100
173	LGDIETATRAKQIVERI	H1N1	NS1	H-2-KD	MOUSE	100	84	100	79	84	84	100	79	74	74	84	74	74	74	74	84	100
174	LIDALLGDP	H3N2	HA	H-2-IAD	MOUSE	44	44	56	44	44	44	56	100	100	100	100	100	100	100	100	44	44
175	LIKTEKNEKFHOIEKFSEVEGRIQDLEKVV EDTKI	H3N2	HA		HUMAN	26	40	40	40	40	40	40	97	100	26	97	100	97	100	97	37	37
176	LKGFQTAQRAMDDQVRES	H3N2	NP		HUMAN	100	95	95	100	100	100	90	100	100	100	100	100	95	95	100	100	100
177	LKLATGMRNVPKQKT	H3N2	HA		MOUSE	53	47	47	47	47	47	47	100	100	100	100	100	100	100	100	53	53
178	LKTTPRPLRLPNQPP	H3N2	PA		MOUSE	93	87	100	87	87	87	87	80	87	80	87	80	87	80	87	80	93
179	LKYNIGITETI	H1N1	NA	H-2-IAD;H-2-KD	MOUSE	91	100	100	100	100	100	100	36	36	36	36	36	36	36	91	91	
180	LLCVLLGFMWACQKGNIRCNCI	H3N2	HA		HUMAN	24	40	40	40	40	40	40	100	100	24	96	100	96	100	36	24	
181	LLONSQVYSIRPNE	H3N2	NP		MOUSE	100	93	100	93	93	93	100	100	100	100	100	100	100	100	87	93	
182	LPACVYVPAVASGYD	H3N2	NP	H-2-B CLASS II	MOUSE	100	100	100	93	93	93	93	93	93	100	100	93	93	87	100	93	
183	LPFDKPTIM	H3N2	NP	HLA-B*3501	HUMAN	67	89	78	89	89	85	89	78	67	89	100	67	67	67	89	67	67
184	LPFDKSTIM	H3N2	NP	HLA-B*3501	HUMAN	67	89	78	89	89	89	78	89	78	100	89	78	78	78	67	67	67
185	LPFDRTVM	H1N1	NP	HLA-B7		67	78	100	78	78	78	78	78	67	67	67	67	67	67	67	67	67
186	LPFEKSTVM	H3N2	NP	HLA-B*3501	HUMAN	67	67	67	67	67	67	56	89	100	78	67	100	100	100	78	67	67
187	LPRRSAGAAGAAVKG	H3N2	NP		HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	93	100
188	LRGSAVHKSLPCV	H3N2	NP		MOUSE	100	100	100	100	93	100	100	100	100	100	100	100	100	100	100	100	100
189	LRSRYWAI	H3N2	NP	HLA-B*2702	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	88	88	100	100	100
190	LRVLSFIRGTVKSPRGLSTRG	H3N2	NP		HUMAN	86	86	91	86	86	91	91	95	95	95	100	95	95	95	95	82	82
191	LSLRNPILV	H1N1	PB1	H-2-DB;H-2-KB	MOUSE	56	44	44	44	44	44	44	44	44	44	44	44	44	44	44	56	56
192	LSQMSKEVNARIEFP	H3N2	PA		MOUSE	100	100	100	100	100	100	100	93	93	100	93	93	93	93	100	100	100
193	LSSRSIYWTIVKPGDVLVI	H3N2	HA	H-2-IEK	MOUSE	35	40	40	40	40	40	35	85	90	95	100	90	85	85	95	40	40
194	LSWKQVLAELQDIEN	H3N2	PA		MOUSE	93	87	100	93	93	100	100	100	93	100	100	93	87	93	100	93	93
195	LTGKILGFVFTLVPSERG	H2N2	M1	HLA-A2.1	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
196	LVKITNDQIEVTNATELVQSSSTGRICDPS PHIRL	H3N2	HA		HUMAN	23	23	23	23	23	23	23	100	100	91	89	100	91	97	91	26	26
197	LYEKVKSQI	H1N1	HA	H-2-KD	MOUSE	44	100	100	100	100	100	100	56	56	44	56	56	56	56	56	44	67
198	LYIWIHHPSTNQEQTSLYVQAS	H3N2	HA	H-2-IAD;H-2-IED	MOUSE	52	39	43	39	39	39	52	78	74	91	86	74	70	70	91	48	52
199	LYIWIHHPSTNQEQTSLYVQAS	H3N2	HA	H-2-IAD	MOUSE	57	43	39	43	43	43	57	83	78	96	100	78	74	74	96	52	48
200	LYONVGTYY	H2N2	HA	H-2-KD	MOUSE	67	56	56	56	56	56	56	56	56	56	56	56	56	56	56	67	67
201	LYONVGTYY	H2N2	HA	H-2-KD	MOUSE	70	50	60	50	50	50	60	50	50	50	50	50	50	50	50	70	70
202	MELVYRIKRGINDRN	H3N2	NP		MOUSE	93	87	100	87	87	87	93	93	93	93	93	93	93	93	87	93	93
203	METMESSTLRSRY	H3N2	NP		MOUSE	93	73	100	87	73	87	100	93	87	93	87	87	73	73	93	80	93
204	MGLYNRM	H1N1;H2N2	M1	H-2-KB	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
205	MIKRGINDRNFWRGE	H3N2	NP	H-2-B CLASS II	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	93	100	100	100
206	MLIIW	H2N2	HA	H-2-M3	MOUSE	60	60	60	60													

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						A/Brevig Mission/118	A/New Caledonia/2099	A/PR/8/34	A/Taiwan/1/86	A/Texas/36/91	A/USSR/90/77	A/W5/33	A/Bangkok/1/79	A/Beijing/353/89	A/England/42/72	A/Hong Kong/1/68	A/Leningrad/560/86	A/New York/52/2004	A/Panama/200/799	A/DOR/NJ/307/72	A/Hong Kong/156/97	A/Viet Nam/1194/2004
219	NNPHRLDGDIC	H3N2	HA	H-2-IAK	MOUSE	42	42	42	42	42	42	42	67	67	92	100	67	58	58	100	42	42
220	NPAHKSQLVWMAChS	H3N2	NP		MOUSE	100	93	100	93	93	93	100	100	100	93	93	100	100	100	93	100	100
221	NSEGTGQAADLKSTQAADQINGKLNRLI EKTNEKFH	H3N2	HA		HUMAN	22	54	54	54	54	54	54	97	100	22	97	100	95	97	97	43	49
222	NSGNLIAPRGYFKMRTGKS	H3N2	HA	H-2-IEK	MOUSE	40	45	50	45	45	45	40	95	90	100	100	90	85	85	100	40	40
223	NVKNLYEKVK	H1N1	HA	HLA-A*11		40	100	100	100	100	100	100	40	40	40	40	40	40	40	40	80	80
224	NVVKPHEKGINPNYL	H3N2	PA		MOUSE	100	87	100	87	87	93	100	80	80	87	87	80	80	80	87	87	93
225	NYFTSEVSHCRATEY	H3N2	PA		MOUSE	93	93	100	93	93	93	93	93	93	93	93	93	93	93	93	93	93
226	PIGTCSSECIPTNGSIPNDKPFQNVNRYT GAC	H3N2	HA		HUMAN	42	45	39	42	42	39	42	97	100	94	91	97	94	94	94	39	39
227	PKKTGGPIYKRVLD	H3N2	NP		HUMAN	85	100	85	100	100	100	92	92	92	100	100	92	100	92	100	85	85
228	PKYVKQNTLKL	H3N2	HA	HLA-DR1	HUMAN	50	42	42	42	42	42	42	100	92	100	100	92	92	92	100	75	75
229	PKYVKQNTLKLAT	H3N2	HA	H-2-IED;HLA-DR1;HLA-DR4;HLA-DR7;HLA-DRB1*0101;HLA-DRB1*010101;HLA-DRB1*0102;HLA-DRB1*0301;HLA-DRB1*0302;HLA-DRB1*0401;HLA-DRB1*0402;HLA-DRB1*040301;HLA-DRB1*0405;HLA-DRB1*0701;HLA-DRB1*0701;HLA-DRB1*0901;HLA-DRB1*1101;HLA-DRB1*1102;HLA-DRB1*1103;HLA-DRB1*11	HUMAN;MOUSE	54	46	46	46	46	46	46	100	92	100	100	92	92	92	100	77	77
230	PKYVKQNTLKLATG	H3N2	HA		MOUSE	57	50	50	50	50	50	50	100	93	100	100	93	93	93	100	79	79
231	PKYVRSAKLRMT	H3N2	HA	H-2-IED		85	100	100	92	92	92	92	46	46	46	46	46	46	46	46	54	54
232	PLKAEIAQRLLEDV	H7N7	M1	HLA-DRB1*0101;HLA-DRB1*010201	HUMAN	100	92	100	100	100	100	100	100	100	100	100	100	100	100	100	100	92
233	PNENPAHKSQLVWMAChS	H3N2	NP		HUMAN	94	100	94	100	100	100	94	94	94	100	100	94	94	94	100	89	94
234	PNFSLENFRAYVDG	H3N2	PA	H-2-DB	MOUSE	100	87	100	93	93	93	100	93	93	93	93	93	93	93	100	100	100
235	PNGPPCSQRSKFLM	H3N2	PA		MOUSE	93	87	100	87	87	93	93	87	93	87	87	87	93	93	87	93	93
236	PNGYIEGK	H1N1	PA		MOUSE	100	100	100	100	100	100	100	88	88	88	100	88	88	88	88	88	88
237	PRMCSLMQGSTLPRR	H3N2	NP	H-2-B CLASS I	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
238	PSFDMNSNEGSYFFGDNAEYVDN	H3N2	NP		HUMAN	100	100	100	100	100	100	100	100	100	100	95	100	32	95	100	100	100
239	PSTNQEOTSLYVGAS	H3N2	HA	H-2-B CLASS II	MOUSE	47	33	33	33	33	33	47	73	67	93	100	67	60	60	93	40	40
240	QDLEKYVEDTKIDLWS	H3N2	HA		HUMAN	31	38	38	38	38	38	38	100	100	31	100	100	100	100	100	38	38
241	QDLEKYVEDTKIDLWSYNAELLVALENO HTIDLDS	H3N2	HA		HUMAN	25	56	56	56	56	56	53	100	100	25	100	97	97	100	100	53	53
242	OKLPGNDNSTATLCLGHAVPNGTLVKT ITNDQIE	H3N2	HA		HUMAN	23	23	23	23	23	23	23	97	100	97	94	100	97	97	94	23	23
243	QMVOAMITIGTPSS	H3N2	M1		MOUSE	93	87	93	87	87	87	93	87	87	87	87	87	87	87	87	87	93
244	QNVNRYTACPRYVKQNTLKLATGMRN VPEKQT	H3N2	HA		HUMAN	47	47	44	47	47	44	44	94	100	94	94	97	100	100	94	50	50
245	QVYSLRPNENPAHK	H3N2	NP	H-2-B CLASS II	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	87	93	
246	RASVGMIDGIGREY	H3N2	NP		HUMAN	87	87	93	93	93	100	100	100	100	100	93	100	93	100	100	80	80
247	RATEYIMKGVYINTA	H3N2	PA	H-2-B CLASS II	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
248	RELILYDKIEIRRIW	H3N2	NP		MOUSE	100	93	100	93	93	93	100	93	93	93	93	93	93	93	93	100	100
249	RENAEDMNGCFKIHKCDNACIGSIRN GTYDH	H3N2	HA		HUMAN	21	58	64	58	58	58	64	100	100	27	94	100	100	100	100	64	67
250	RFYIQMCTEL	H1N1	NP	H-2-D CLASS I	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
251	RGEETIERFEITGT	H3N2	PA		MOUSE	100	100	100	100	100	100	100	93	87	100	100	80	87	87	100	100	93
252	RGLQRRRFVQNLGNNG	H1N1	M1	HLA-A2	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
253	RGVQIASNENALMTE	H3N2	NP	H-2-DB	MOUSE	93	73	100	87	73	87	100	93	87	93	87	87	80	80	93	80	87
254	RIAYERNILKGF	H3N2	NP	H-2-B CLASS I	MOUSE	100	100	100	100	100	100	100	93	93	93	93	93	93	93	93	100	100
255	RIEFLKTPRPLRL	H3N2	PA		MOUSE	100	93	100	93	93	93	93	80	80	87	87	80	73	80	87	100	100
256	RKLKREITF	H3N2	M1	SAOE-G*02;SAOE-G*12	COTTON-TOP TAMARIN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	78	89
257	RLEDVFAGK		M1	HLA-A1;HLA-A3	HUMAN	100	89	100	100	100	100	100	100	100	100	100	100	100	100	100	100	89
258	RLIQNSLTI	H1N1;H2N2;H3N2	NP	H-2-DB;HLA-A*0201	MOUSE	89	100	100	100	100	100	100	100	100	100	100	100	100	100	100	89	89
259	RLIQNSLTIERMVLS	H2N2	NP		MOUSE	93	100	100	100	100	100	100	100	100	100	100	93	93	100	93	93	
260	RLIQNSLTIERMVLSAFDERRNK	H3N2	NP	H-2-D CLASS II	MOUSE	96	100	100	100	100	100	100	96	96	96	100	96	91	91	96	91	91
261	RMCNILKGFQTAAG	H3N2	NP		MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
262	RNGPMTNTVHYPKIY	H3N2	PB2		MOUSE	80	73	100	87	73	87	87	87	87	87	87	87	80	80	80	80	73
263	RNLFPDRITIMAAFN	H3N2	NP		MOUSE	80	87	100	87	87	87	87	73	67	80	80	87	67	67	80	80	80
264	RPLRLFNPGPPCSORS	H3N2	PA		MOUSE	93	80	100	80	80	87	93	73	80	73	80	73	80	80	73	93	93
265	RRATAILRK	H3N2	PB2	HLA-B*27052/KB	MOUSE	100	89	100	89	89	89	100	89	89	89	89	89	89	89	89	100	100
266	RRSFEIKKL	H3N2	PB1	HLA-B*27052/KB	MOUSE	100	100	100	100	100	100	100	89	89	89	89	89	89	89	89	89	89
267	RRSGAAGAAVK	H1N1;H3N2	NP	HLA-B27	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	91	100	
268	RSAILRGSVAHKSC	H3N2	NP		MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
269	RSAYERMCNILKGF	H2N2	NP		MOUSE	93	93	93	93	93	93	93	100	100	93	100	100	100	100	93	93	93

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						A/Brevig Mission/118	A/New Caledonia/2099	A/PR/8/34	A/Taiwan/1/86	A/Texas/36/91	A/USSR/9/077	A/W8/33	A/Bangkok/1/79	A/Beijing/3/53/89	A/England/4/72	A/Hong Kong/1/68	A/Leningrad/360/86	A/New York/5/2004	A/Panama/2007/99	A/ODR/NJ/307/72	A/Hong Kong/1/56/97	A/Viet Nam/11/94/2004	
270	RSDAPIDTCISECTPNGSI	H3N2	HA	H-2-IAK	MOUSE	50	50	40	45	45	45	45	90	90	95	100	90	85	85	95	35	35	
271	RSLASWQIENFKAC	H3N2	PA		MOUSE	93	87	100	93	93	93	100	93	93	93	93	93	93	93	93	100	93	
272	RSQQTVPNIGSRPVRGSSRSISYWT	H3N2	HA		HUMAN	42	44	44	47	47	47	42	89	94	89	86	92	89	92	92	44	42	
273	RSYLRLAL	H1N1;H2N2	PB1	H-2-KB	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	88	88	100	88	88	
274	RTFSFQLI	H1N1;H3N2	NS2	H-2-KB;MAMU-A*02	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	88	
275	RTGMDPRMCSLMQGS	H3N2	NP		MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
276	RTLYQNVGTYY	H2N2	HA	H-2-KD	MOUSE	55	45	45	45	45	45	45	45	45	45	45	45	45	45	45	55	55	
277	RTLYQNVGTYYVSGTSTLNK	H2N2	HA	H-2-D CLASS I;H-2-KD	MOUSE	55	40	50	40	35	40	45	30	30	30	30	30	30	30	30	70	70	
278	RVDGKWMRELVL	H3N2	NP		HUMAN	83	92	83	100	92	100	83	100	83	100	100	83	92	100	100	75	75	
279	RYWAIRTR	H3N2	NP	HLA-B*2705	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	88	88	100	100	100	
280	SAAFEDLR	H3N2	NP	HLA-DQW5	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
281	SAAFEDLRVLSFIKG	H1N1	NP	HLA-B37	HUMAN	87	87	100	87	87	87	87	87	87	87	93	87	87	87	87	87	87	
282	SAAFEDLRVLSFIRG	H3N2	NP	HLA-B37	HUMAN	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	
283	SCLENFRAYV	H3N2	PA	H-2-D CLASS I;H-2-DB	MOUSE	90	90	90	100	100	100	90	100	100	100	100	100	100	100	100	90	90	
284	SDMRAEILRMMEG	H3N2	NP		MOUSE	85	85	85	85	85	85	77	100	100	100	100	100	100	100	100	85	85	
285	SDRMVMSPLAVTWWN	H3N2	PB2		MOUSE	100	93	100	93	93	100	100	100	100	100	100	100	100	100	100	100	100	
286	SDYEGRLI	H1N1;H2N3	NP	H-2-K CLASS I;H-2-KK;MAMU-A*11	MOUSE	100	88	100	88	88	100	100	100	100	100	100	100	100	100	100	88	100	
287	SDYEGRLIQNSLTI	H1N1;H3N2	NP	H-2-DB;H-2-KD;H-2-KK;HLA-B37	MOUSE	93	93	100	93	93	100	100	100	100	100	100	100	100	100	86	93		
288	SETQGTEKLTITYSS	H3N2	PB2		MOUSE	100	100	100	100	100	100	100	93	93	93	100	93	93	93	93	93	100	
289	SFERFEIPKE	H1N1	HA	H-2-IED	MOUSE	82	100	100	100	100	100	91	36	36	45	45	36	36	36	45	45	45	
290	SFYRNWVLIKK	H5N9	HA	H-2-D CLASS I	MOUSE	75	67	67	67	75	67	75	33	33	42	33	33	33	33	33	92	92	
291	SGPDNGAVAV	H1N1	NA	H-2-DB		100	100	100	90	100	90	90	40	40	40	50	40	40	40	40	100	100	
292	SGPLKAEIAQRLE	H1N1	M1	HLA-DR1;HLA-DR7 DW11;HLA-DRB1*0304;HLA-DRB1*0405;HLA-DRB1*0701;HLA-DRB1*0802;HLA-DRB1*1101;HLA-DRB1*1401;HLA-DRB1*1402	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	92	
293	SGPLKAEIAQRLEDV	H1N1	M1	HLA-B37;HLA-DR1	HUMAN	100	93	100	100	100	100	100	100	100	100	100	100	100	100	100	100	93	
294	SGSFVQHPELTGL	H1N1	NA		MOUSE	100	100	100	100	100	100	100	38	38	38	38	38	38	38	38	92	100	
295	SIRNGTYDHDVYRDE	H3N2	HA		MOUSE	33	53	60	53	53	60		100	100	33	93	100	100	100	100	53	60	
296	SKAFSNCYFYDPDYASL	H3N2	HA		MOUSE	39	33	39	33	33	39		100	94	94	100	100	94	94	100	44	39	
297	SLVGDIPFKLLQNSGVYSLIRP	H3N2	NP		HUMAN	95	91	95	95	95	95	95	100	100	100	100	100	100	100	100	91	91	
298	SMIEAESSVKEDMT	H3N2	PA		MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	93	100	100	93	100	
299	SNEGSYFF	H3N2	NP	SAOE-G*08	COTTON-TOP TAMARIN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	88	
300	SNLNDATYQRTRALV	H3N2	NP		MOUSE	100	93	100	93	93	93	100	93	93	93	93	93	100	93	93	100	100	
301	SQLVWMACHSAAFED	H3N2	NP		MOUSE	100	93	100	93	93	93	100	100	100	93	93	100	100	100	93	100	100	
302	SRYWAI		NP	HLA-B8		100	100	100	100	100	100	100	100	100	100	100	83	83	100	100	100	100	
303	SRYWAIRTR	H1N1;H3N2	NP	HLA-B*08;HLA-B*2703;HLA-B*2705;HLA-B*27052/KB;HLA-B27	HUMAN;MOUSE	100	100	100	100	100	100	100	100	100	100	100	89	89	100	100	100	100	
304	SSFSFGGTFKRTSG	H3N2	PB2		MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	93	100	
305	SSISFCGV	H1N1	NA	H-2-KB		100	100	100	100	100	100	88	63	63	63	63	63	63	63	63	100	100	
306	SSLENFRAYV	H1N1;H3N2;H3N8	PA	H-2-DB	MOUSE	100	80	100	90	90	90	100	90	90	90	90	90	90	90	90	100	100	
307	SSYRRPVI	H1N1;H2N2;H3N2	PB1	H-2-KB	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
308	STNQEOTSLVQASGRVTVS	H3N2	HA	H-2-B CLASS II;H-2-D CLASS II;H-2-IAD	MOUSE	40	30	30	25	30	25	40	80	75	95	100	75	65	70	95	30	30	
309	SVORNLPFDKPTMAAFTGNTGEG	H2N2;H3N2	NP		MOUSE	87	96	87	91	91	91	96	91	87	96	100	87	87	87	96	83	87	
310	SVSSFERFEIPK	H1N1	HA	H-2-IED	MOUSE	92	100	100	100	100	100	92	38	38	38	38	38	38	38	38	38	38	
311	SYNAELLVAL	H3N2	HA	H-2-D CLASS I	MOUSE	40	80	80	80	80	80		100	100	40	100	100	90	100	100	70	70	
312	SYNAELLVALENOHTI	H3N2	HA		HUMAN	31	69	69	69	69	69	69	100	100	31	100	94	94	100	100	63	63	
313	TALANTIEV	H1N1;H2N2;H3N2	PB1	H-2-D CLASS I;H-2-DB	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	89	
314	TELKLSDYEGRLIQNS	H3N2	NP		MOUSE	100	94	100	94	94	100	100	100	100	100	100	100	100	100	94	100		
315	TELKLSDYEGRLIQNSLTIER	H3N2	NP	H-2-D CLASS II	MOUSE	95	95	100	95	95	100	100	100	100	100	100	100	95	95	100	90	95	
316	TETIKSQRKILRLQ	H1N1	NA		MOUSE	80	87	100	93	87	93	93	60	60	53	53	60	67	67	53	80	80	
317	TGKICNPHRLDGDICTLI	H3N2	HA	H-2-IAD	MOUSE	30	30	30	30	30	30	30	75	75	95	100	75	70	70	100	30	30	
318	TGKICNPHRLDGDICTLID	H3N2	HA	H-2-IAK	MOUSE	29	29	29	29	29	29	29	76	76	95	100	76	71	71	100	29	29	
319	TMAAFNGTTEGRDS	H3N2	NP		MOUSE	93	93	100	87	87	87	93	87	87	93	93	87	87	87	93	93	93	
320	TKGILGFVFTLV	H1N1	M1	HLA-A2	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
321	TLIDALLG	H3N2	HA	H-2-IAD	MOUSE	50	50	50	50	50	50	50	100	100	100	100	100	100	100	100	50	50	
322	TNEKFHQIEKFESEVE	H3N2	HA		HUMAN	38	38	38	38	38	38	38	100	100	38	100	100	100	100	100	38	38	
323	TNTVHYPIKYTYFE	H3N2	PB2		MOUSE	87	80	100	93	80	93	93	87	87	80	87	87	80	80	80	87	80	
324	TRALVRTGMDPRMCS	H3N2	NP	H-2-B CLASS I	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
325	TREILTKTIVDHPMAI	H3N2	PB2		MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
326	TRRSQQTIPNIGSRPVRGLS	H3N2	HA	H-2-IAD	MOUSE	32	32	32	32	32	32	32	95	91	91	95	96	77	82	95	41	36	
327	TSLYVRASGRVTVSTK	H3N2	HA	HLA-DR;HLA-DRB1*0101;HLA-DRB1*0401	HUMAN	38	38	38	38	38	38	38	94	94	94	98	94	75	75	94	38	38	

Table S4. Conservancy analysis of T cell linear epitope sequences

No.	Sequence	Influenza Source Subtype	Source Protein	MHC Restriction Allele(s)	Host Species	H1N1						H3N2						H5N1					
						A/Brevig Mission/118	A/New Caledonia/2099	A/PR/8/34	A/Taiwan/1/86	A/Texas/36/91	A/USSR/90/77	A/W8/33	A/Bangkok/1/79	A/Beijing/3/89	A/England/42/72	A/Hong Kong/1/68	A/Leningrad/560/86	A/New York/57/2004	A/Panama/2007/99	A/DOR/NJ/307/72	A/Hong Kong/156/97	A/Viet Nam/1194/2004	
328	TYQRTALV	H1N1;H2N3;H3N2	NP	H-2-D CLASS I;H2-DB;H-2-KD;PATR-A*0901	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
329	TYQRTALVRTG	H1N1;H3N2	NP	H-2-D CLASS I;H2-KD	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
330	TYQRTALVRTGMD	H3N2	NP	H-2-KD	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
331	TYQRTALVRTGMDP	H1N1;H2N2;H3N2	NP	H-2-KD	HUMAN;MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
332	TYVSVGTST	H2N2	HA	H-2-KD	MOUSE	67	56	67	56	56	56	56	44	44	44	44	44	44	44	44	44	89	89
333	TYVSVGTSTL	H2N2	HA	H-2-KD	MOUSE	60	50	60	50	50	50	50	40	40	40	40	40	40	40	40	40	90	90
334	VAHKSLPACVYGP	H2N2	NP	H-2-S CLASS II	MOUSE	100	100	100	100	93	100	93	100	100	100	100	100	100	100	100	100	93	93
335	VETPIRNEW	H1N1	M2	HLA-B*27:HLA-B*44	HUMAN	89	67	100	67	67	100	100	67	67	100	100	67	100	67	67	67	89	
336	VFPNEVGARILTSE	H1N1	PB2	H-2-D CLASS I	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
337	VGLSLILQI	H1N1	NA	H-2-IED	MOUSE	90	70	100	80	80	80	90	50	50	50	50	50	50	50	50	50	80	60
338	VKILPKDRWTOH	H2N2	HA	HLA-DRW11	HUMAN	33	33	42	33	33	33	42	42	42	42	42	42	42	42	42	42	42	42
339	VLAELQDIENEKIP	H3N2	PA		MOUSE	100	87	100	93	93	100	100	100	93	100	100	93	87	93	100	100	93	93
340	VLMEWLKRPLSPLTKGIL	H1N1	M1	HLA-DP81*0401	HUMAN	95	95	100	95	95	95	100	95	95	95	95	95	95	95	95	95	95	95
341	VLRGFLIL	H1N1	PB2	H-2-KB		100	100	100	100	100	100	100	100	100	100	100	88	88	100	100	100	100	100
342	VLWGIHFPNSK	H1N1	HA	H-2-IED	MOUSE	67	75	92	67	67	67	67	50	42	42	42	50	42	42	42	58	67	
343	VPNGTLVKTTNDQIEVTNAT	H3N2	HA	HLA-DR	HUMAN	29	29	29	29	29	29	29	100	100	100	95	100	95	95	100	29	29	
344	VRESRNPAGNAIEDLIFLARS	H3N2	NP	H-2-D CLASS II	MOUSE	100	95	90	95	95	100	95	95	95	100	100	95	100	100	100	100	100	100
345	VSDGGPNLY	H1N1;H2N2	PB1	HLA-A*0101;HLA-A1;MAMU-A*02	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
346	VSPALVTWNRNGPM	H3N2	PB2		MOUSE	93	87	100	87	87	93	93	93	93	100	100	93	93	93	93	93	93	93
347	VTGLRNIPS	H1N1	HA		MOUSE	89	100	100	100	100	100	100	56	56	56	56	56	56	56	56	56	56	56
348	VTGLRNIPSI	H1N1	HA	H-2-IED;MAMU-A*02		90	100	100	100	100	100	100	50	50	50	50	50	50	50	50	50	50	50
349	VTGLRNIPSISQ	H1N1	HA	H-2-IED	MOUSE	92	100	100	100	100	100	92	50	50	50	50	50	50	50	50	50	50	50
350	VTGLRNIPSISQSR	H1N1	HA	H-2-IED	MOUSE	92	100	100	100	100	100	92	54	54	54	54	54	54	54	54	54	54	54
351	VTQNGGNSACKRPGPG	H3N2	HA		MOUSE	33	33	33	33	33	33	33	73	60	93	100	67	67	60	93	33	33	33
352	VTVSTKRQQTIVPNI	H3N2	HA		HUMAN	38	31	38	38	38	38	38	88	94	81	81	94	88	94	88	94	81	31
353	VTWWRNGPMTNTVH	H3N2	PB2		MOUSE	80	73	100	87	73	87	87	93	93	93	93	93	87	87	87	87	87	87
354	VYQILAIYATVAGSLAIMMAG	H2N2	HA	H-2-D CLASS I;H2-KD	MOUSE	30	61	57	61	61	61	61	26	26	26	26	26	26	26	26	26	26	74
355	WGIHPSTNOEQTSL	H3N2	HA		MOUSE	60	47	53	47	47	47	67	73	67	87	93	67	60	60	67	60	67	
356	WIONEFKACELTDS	H3N2	PA		MOUSE	93	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	93
357	WVWELRGRPKK	H1N1	NA		MOUSE	83	67	100	83	83	92	75	67	67	67	67	67	67	67	67	67	67	100
358	YACKRGSVNSFFSRRLNWLHKSEYKYPALNVTMPNN	H3N2	HA		HUMAN	37	31	34	34	34	31	34	86	94	74	71	91	77	80	71	31	31	31
359	YASRLSVASSGTFE	H3N2	HA		HUMAN	38	38	38	38	38	38	38	100	100	94	100	100	100	100	100	100	44	44
360	YDVPDYASRLSVASS	H3N2	HA	HLA-DRB1*0101;HLA-DRB1*0701	HUMAN	38	38	38	38	38	38	38	100	100	94	100	100	100	100	100	38	38	38
361	YIYGIIHPSTNOEQTSLY	H3N2	HA		MOUSE	56	44	50	44	44	44	61	78	72	89	94	72	67	67	89	56	61	
362	YINRIHLIPEVCLWK	H3N2	PB1	H-2-IED	MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
363	YPALNVTMPNPNKFKDLIYIYGVHPHSTDRDQTS	H3N2	HA		HUMAN	48	42	39	45	45	45	45	85	91	79	82	85	88	91	85	39	36	
364	YRRVNGKWM	H1N1	NP	H-2-DB	MOUSE	78	67	100	78	67	78	78	89	78	78	78	67	89	78	67	67	67	67
365	YRYNGVWI	H1N1	NA	H-2-DB		78	89	100	100	100	89	44	44	44	44	44	44	44	44	44	78	78	
366	YSLVIGDPFRLONS	H3N2	NP		MOUSE	100	80	100	87	87	87	100	93	93	93	93	93	93	93	93	100	100	
367	YTLDEESRAIKTRL	H3N2	PA		MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	93	100	
368	YVQNTLKLATGMRNV	H3N2	HA		HUMAN	50	44	44	44	44	44	44	100	100	100	100	100	100	100	100	69	69	
369	YVOASGRVTVSTRRS	H3N2	HA	H-2-IAB	MOUSE	40	40	40	40	40	40	40	87	87	87	100	87	80	87	93	40	40	
370	YVSVGTSTLNK	H2N2	HA	H-2-KD	MOUSE	64	45	64	55	45	55	55	45	45	45	45	36	36	45	45	82	82	
371	YVSVGTSTLNK	H3N2	HA	H-2-IAD	MOUSE	46	38	38	38	38	38	46	69	62	92	100	62	54	54	92	38	38	
372	YVSVGTSTLNK	H3N2	HA	H-2-IAD	MOUSE	43	36	36	36	36	36	43	71	64	93	100	64	57	57	93	36	36	
373	YVSVGTSTLNK	H3N2	HA	H-2-K CLASS II	MOUSE	21	23	23	21	21	21	21	82	79	92	100	82	74	77	97	31	28	
374	YVSVGTSTLNK	H6N1	NP	HLA-A2.1/KB	MOUSE	78	67	67	67	67	67	67	67	67	67	67	67	67	67	67	89	100	
375	YVSVGTSTLNK	H2N2	HA	H-2-KD	MOUSE	71	71	71	71	71	71	71	43	43	43	43	43	43	43	43	71	71	
376	YVSVGTSTLNK	H1N1	NP		HUMAN	89	100	100	100	100	85	89	78	78	89	89	78	89	89	89	89	89	
377	YVSVGTSTLNK	H1N1	PA	HLA-A*0201;HLA-A*0202;HLA-A*0206	HUMAN	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
378	YVSVGTSTLNK	H1N1	HA	HLA-A*0301;HLA-A11		100	89	100	89	89	100	100	44	44	44	44	44	44	44	44	44	44	44
379	YVSVGTSTLNK	H1N1	HA	HLA-A11		44	56	100	67	67	67	67	67	44	56	56	56	44	56	56	44	56	56
380	YVSVGTSTLNK	H1N1	NA	HLA-A*0201		89	78	100	89	89	89	89	56	56	56	56	56	56	56	56	78	67	
381	YVSVGTSTLNK	H1N1	M2	HLA-A2/KB	MOUSE	89	89	100	89	89	89	89	89	89	89	89	89	89	89	89	89	89	67
382	YVSVGTSTLNK	H1N1	M1	HLA-A*0201;HLA-A*020101;HLA-A*0203	HUMAN;MOUSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
383	YVSVGTSTLNK	H1N1	NA	H-2-IED	MOUSE	88	75	100	88	88	100	88	50	50	50	50	50	50	50	50	88	75	
384	YVSVGTSTLNK	H1N1	HA	H-2-KD	MOUSE	40	93	100	93	93	93	93	33	33	33	33	33	33	33	33	87	93	
385	YVSVGTSTLNK	H1N1	HA	H-2-KD	MOUSE	35	94	100	94	94	94	94	35	35	35	35	35	35	35	35	82	88	
386	YVSVGTSTLNK	H1N1	HA	H-2-KD	MOUSE	30	95	100	95	95	95	95	30	30	30	30	30	30	30	30	70	75	
387	YVSVGTSTLNK	H1N1	HA	H-2-KD	MOUSE	30	96	100	96	96	96	96	30	30	30	30	30	30	30	30	61	65	
388	YVSVGTSTLNK	H1N1	M2	HLA-A11	HUMAN	89	78	100	78	78	85	89	89	89	89	89	89	89	89	89	78	78	
389	YVSVGTSTLNK	H1N1	PA	HLA-A*0201																			

Table S4. Conservancy analysis of T cell linear epitope sequences

No.	Sequence	Influenza Source Subtype	Source Protein	MHC Restriction Allele(s)	Host Species	H1N1							H3N2							H5N1				
						A/Brevig Mission/118	A/New Caledonia/2099	A/PR/8/34	A/Taiwan/1/86	A/Texas/36/91	A/USSR/90/77	A/W9/33	A/Bangkok/1/79	A/Beijing/353/89	A/England/42/72	A/Hong Kong/1/68	A/Leningrad/360/86	A/New York/57/2004	A/Panama/2007/99	A/DORNI/307/72	A/Hong Kong/156/97	A/Viet Nam/1194/2004		
393	RTLDFHDSNVK	H1N1	HA	HLA-A*3301;HLA-A*6801;HLA-A11	HUMAN	36	100	100	100	100	100	100	91	45	45	45	45	45	45	45	45	45	100	100
394	RVLFSFKGTK	H1N1	NP	HLA-A*3101;HLA-A*6801;HLA-A11	MOUSE	70	70	100	70	70	80	80	80	80	80	80	90	80	80	80	80	80	70	70
395	SIIPSGPLK	H1N1	M1	HLA-A*3101;HLA-A11	HUMAN	89	89	100	89	89	89	89	89	89	89	89	89	89	89	89	89	89	100	100
396	SLCPIRGWAI	H1N1	NA	HLA-A*0201;HLA-A*0206	HUMAN	90	80	100	90	100	100	100	40	40	40	40	40	40	40	40	40	40	90	80
397	SLENFRAYV	H1N1	PA	HLA-A*0201;HLA-A*0203;HLA-A*6802	HUMAN	100	78	100	89	89	89	100	89	89	89	89	89	89	89	89	89	89	100	100
398	VTAACSHACK	H1N1	HA	HLA-A*0301;HLA-A11		80	70	100	90	70	80	80	40	40	40	40	40	40	40	40	40	40	40	50
399	YFKIHTGKSS	H3N2	HA		HUMAN	50	50	50	50	50	50	50	90	90	80	80	90	80	80	80	80	80	40	40
400	YGKONTLKLA	H3N2	HA		HUMAN	40	50	40	50	50	40	40	90	90	90	90	90	90	90	90	90	90	60	60
401	YIKQDTLKLA	H3N2	HA		HUMAN	40	40	40	40	40	40	40	80	80	80	80	80	80	80	80	80	80	50	50
402	YIKONTLKLA		HA		HUMAN	40	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	60	60
403	YIKONTLKLS	H3N2	HA		HUMAN	40	40	40	40	40	40	40	80	80	80	80	80	80	80	80	80	80	50	50
404	YVKENTLKLA	H3N2	HA		HUMAN	40	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	70	70
405	YVKQDTLKLA	H3N2	HA		HUMAN	40	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	60	60
406	YVKQHTLKLA	H3N2	HA		HUMAN	40	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	60	60
407	YVKONSLKLA	H3N2	HA		HUMAN	40	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	70	70
408	YVKONTLKLA	H3N2	HA		HUMAN	40	40	40	40	40	40	40	100	100	100	100	100	100	100	100	100	100	70	70
409	YVKONTLKVA	H3N2	HA		HUMAN	40	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	60	60
410	YVKONTLRLA	H3N2	HA		HUMAN	50	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	70	70
411	YVKQSTLKLA	H3N2	HA		HUMAN	50	50	50	50	50	50	50	90	90	90	90	90	90	90	90	90	90	60	60
412	YVKQTTLKLA	H3N2	HA		HUMAN	50	40	40	40	40	40	40	90	90	90	90	90	90	90	90	90	90	60	60

Identity level color code:  
 Yellow: 100%  
 Magenta: ≥90%  
 Green: ≥80%