

Supplementary file 5

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A domain-based vaccine construct against SARS-CoV-2, the causative agent of COVID-19 pandemic: development of self-amplifying mRNA and peptide vaccines

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Table S7. Population coverage of all predicted CD8⁺ and CD4⁺ T-cell epitopes in the most-affected countries by COVID-19.

Country	HLA class I			HLA class II *		
	Coverage ^a (%)	Average hit ^b	Pc90 ^c	Coverage ^a	Average hit ^b	Pc90 ^c
United States	98.72	10.07	4.7	85.99	2.94	0.71
Italy	98.95	9.93	4.33	84.66	1.49	0.65
Spain	86.27	5.86	0.73	79.61	2.29	0.49
China	93.84	7.88	2.42	54.75	1.5	0.22
Germany	99.88	10.89	5.77	89.89	3.3	0.99
Iran	97.08	8.75	3.56	63.26	1.6	0.27
France	99.65	10.21	5.03	87.63	3.04	0.81
England	99.88	10.12	5.52	92.73	3.42	1.15
Belgium	98.85	7.28	3.56	78.47	2.05	0.46
Turkey	44.8	2.24	0.91	73.37	2.08	0.38
Austria	99.91	11.26	6.14	92.6	3.46	1.15
South Korea	97.34	11.09	4.65	79.8	2.68	0.49
Portugal	98.42	9.46	4.14	76.7	2.09	0.43
Brazil	94.34	7.51	2.35	44.39	0.98	0.18
Australia	93.92	7.37	2.23	24.23	0.55	0.13
Sweden	99.91	11.39	5.7	85.13	3.09	0.67
Canada	NA	NA	NA	17.24	0.49	0.12
Average	93.86	8.83	3.86	71.2	2.18	0.55
SD	13.14	2.34	1.65	22.41	0.94	0.32

SD: standard deviation. ^a, projected population coverage. ^b, Average number of epitope hits / HLA combinations recognized by the population. ^c, Minimum number of epitope hits / HLA combinations recognized by 90% of the

population. NA: not available. * Four HLA-II allele were not available in population coverage calculation, including, HLA-DRB5*01:01, HLA-DRB3*01:01, HLA-DRB4*01:01, HLA-DRB3*02:02.

Table S8. Population coverage of each of 16 predicted CD8⁺ T-cell epitopes in the most-affected countries by COVID-19.

Country	HLA-I (A*02:06, A*23:01, A*24:02, A*32:01, B*35:01, B*51:01, B*53:01) (Epitope: IKWPWYIWLGF)		
	Coverage	Average hit	pc90
Australia	43.72%	0.47	0.18
Austria	43.45%	0.51	0.18
Belgium	22.38%	0.23	0.13
Brazil	37.09%	0.43	0.16
China	39.14%	0.44	0.16
England	34.10%	0.39	0.15
France	48.35%	0.58	0.19
Germany	43.94%	0.52	0.18
Iran	57.08%	0.72	0.23
Italy	58.19%	0.73	0.24
Korea; South	62.16%	0.79	0.26
Portugal	52.95%	0.66	0.21
Spain	29.88%	0.33	0.14
Sweden	45.39%	0.52	0.18
Turkey	0.00%	0	0.1
United States	52.23%	0.65	0.21
Average	41.88	0.5	0.18
Standard deviation	14.94	0.2	0.04
Country	HLA-I (A*02:06, A*23:01, A*24:02, A*26:01, A*33:01, A*68:01, B*08:01, B*15:01, B*35:01, B*53:01, B*58:01) (Epitope: LQIPFAMQMAYRF)		
	Coverage	Average hit	pc90
Australia	53.52%	0.64	0.22
Austria	61.79%	0.82	0.26
Belgium	44.03%	0.52	0.18
Brazil	54.54%	0.69	0.22
China	53.27%	0.66	0.21
England	57.77%	0.73	0.24
France	63.04%	0.85	0.27
Germany	63.34%	0.85	0.27
Iran	63.97%	0.86	0.28
Italy	61.78%	0.82	0.26
Korea; South	73.84%	1.06	0.38
Portugal	58.91%	0.77	0.24

Spain	31.60%	0.35	0.15
Sweden	68.95%	0.96	0.32
Turkey	0.00%	0	0.1
United States	64.16%	0.88	0.28
Average	54.66	0.72	0.24
Standard deviation	17.07	0.25	0.06
Country	HLA-I (A*02:06, A*02:01, A*23:01, B*44:03, B*40:01, B*44:02)		
	(Epitope: CEFQFCNDPFL)		
	Coverage	Average hit	pc90
Australia	46.66%	0.55	0.19
Austria	63.12%	0.79	0.27
Belgium	63.36%	0.8	0.27
Brazil	47.02%	0.54	0.19
China	33.32%	0.37	0.15
England	70.42%	0.94	0.34
France	57.31%	0.71	0.23
Germany	67.38%	0.87	0.31
Iran	42.76%	0.46	0.17
Italy	50.94%	0.6	0.2
Korea; South	55.50%	0.69	0.22
Portugal	62.28%	0.79	0.27
Spain	62.72%	0.76	0.27
Sweden	63.98%	0.82	0.28
Turkey	44.80%	0.45	0.18
United States	62.56%	0.79	0.27
Average	55.88	0.68	0.24
Standard deviation	10.14	0.16	0.05
Country	HLA-I (A*02:01, A*02:03, A*02:06, A*23:01, A*24:02, A*26:01, A*68:02, B*35:01, B*58:01)		
	(Epitope: GVFVSNQTHWFV)		
	Coverage	Average hit	pc90
Australia	63.97%	0.76	0.28
Austria	81.62%	1.12	0.54
Belgium	58.14%	0.63	0.24
Brazil	60.81%	0.74	0.26
China	57.78%	0.71	0.24
England	66.85%	0.79	0.3
France	69.73%	0.9	0.33
Germany	72.66%	0.92	0.37
Iran	63.64%	0.82	0.28
Italy	69.14%	0.94	0.32
Korea; South	81.76%	1.18	0.55
Portugal	71.48%	0.92	0.35
Spain	58.35%	0.65	0.24
Sweden	73.53%	0.93	0.38
Turkey	44.80%	0.45	0.18
United States	76.55%	1.03	0.43
Average	66.93	0.84	0.33

Standard deviation	9.42	0.18	0.1
Country	HLA-I (B*07:02, B*35:01, B*51:01, B*53:01)		
	(Epitope: FPNITNLCPF)		
	Coverage	Average hit	pc90
Australia	14.41%	0.15	0.12
Austria	44.80%	0.49	0.18
Brazil	27.02%	0.28	0.14
China	14.40%	0.15	0.12
England	41.78%	0.45	0.17
France	34.26%	0.37	0.15
Germany	45.40%	0.5	0.18
Iran	46.42%	0.51	0.19
Italy	54.14%	0.61	0.22
Korea; South	30.38%	0.32	0.14
Portugal	35.70%	0.38	0.16
Spain	25.63%	0.27	0.13
Sweden	45.08%	0.48	0.18
United States	38.36%	0.42	0.16
Average	35.56	0.38	0.16
Standard deviation	11.58	0.13	0.03
Country	HLA-I (A*02:01, A*02:03, A*02:0, A*26:01, A*68:02, B*15:01)		
	(Epitope: GFIAGLIAIVM)		
	Coverage	Average hit	pc90
Australia	34.37%	0.36	0.15
Austria	70.23%	0.86	0.34
Belgium	46.86%	0.47	0.19
Brazil	41.29%	0.44	0.17
China	42.62%	0.5	0.17
England	58.49%	0.66	0.24
France	54.15%	0.62	0.22
Germany	61.76%	0.72	0.26
Iran	46.56%	0.49	0.19
Italy	45.43%	0.49	0.18
Korea; South	60.05%	0.75	0.25
Portugal	50.45%	0.55	0.2
Spain	51.38%	0.53	0.21
Sweden	62.27%	0.77	0.27
Turkey	44.80%	0.45	0.18
United States	54.78%	0.61	0.22
Average	51.59	0.58	0.22
Standard deviation	9.07	0.14	0.05
Country	HLA-I (A*30:01, A*68:02, B*08:01, B*15:01, B*35:01, B*57:01, B*58:01)		
	(Epitope: EVFNATRFASVYAW)		
	Coverage	Average hit	pc90
Australia	23.22%	0.25	0.13
Austria	60.56%	0.79	0.25
Belgium	28.52%	0.3	0.14

Brazil	26.30%	0.29	0.14
China	29.23%	0.32	0.14
England	50.57%	0.57	0.2
France	49.59%	0.59	0.2
Germany	50.93%	0.59	0.2
Iran	41.20%	0.47	0.17
Italy	43.89%	0.48	0.18
Korea; South	42.85%	0.49	0.17
Portugal	31.46%	0.34	0.15
Spain	33.57%	0.36	0.15
Sweden	45.76%	0.5	0.18
United States	41.55%	0.48	0.17
Average	39.95	0.45	0.17
Standard deviation	10.45	0.14	0.03
Country	HLA-I (A*01:01, A*02:06, A*30:02, A*26:01, A*68:01, A*68:02, B*15:01)		
	(Epitope: SGWTAGAAAYYV)		
	Coverage	Average hit	pc90
Australia	22.70%	0.24	0.13
Austria	58.26%	0.7	0.24
Belgium	41.17%	0.44	0.17
Brazil	40.75%	0.45	0.17
China	27.69%	0.3	0.14
England	51.83%	0.6	0.21
France	50.01%	0.58	0.2
Germany	50.49%	0.6	0.2
Iran	26.04%	0.28	0.14
Italy	44.40%	0.49	0.18
Korea; South	40.96%	0.47	0.17
Portugal	35.73%	0.4	0.16
Spain	7.67%	0.08	0.11
Sweden	48.14%	0.58	0.19
Turkey	0.00%	0	0.1
United States	37.92%	0.43	0.16
Average	36.48	0.42	0.17
Standard deviation	15.59	0.19	0.04
Country	HLA-I (A*03:01, A*11:01, A*23:01, A*24:02, A*68:01, B*15:01, B*58:01)		
	(Epitope: LYNSASFSTFKCY)		
	Coverage	Average hit	pc90
Australia	65.67%	0.8	0.29
Austria	57.18%	0.69	0.23
Belgium	58.66%	0.67	0.24
Brazil	53.18%	0.63	0.21
China	71.67%	0.94	0.35
England	58.57%	0.72	0.24
France	60.43%	0.76	0.25
Germany	65.45%	0.84	0.29

Iran	51.56%	0.6	0.21
Italy	53.70%	0.65	0.22
Korea; South	69.41%	0.93	0.33
Portugal	58.43%	0.71	0.24
Spain	14.87%	0.15	0.12
Sweden	82.15%	1.17	0.56
United States	59.48%	0.74	0.25
Average	58.69	0.73	0.27
Standard deviation	14.05	0.21	0.09

Country	HLA-I (A*02:01, A*02:03, A*02:06, A*26:01, A*68:02, B*51:01, B*58:01) (Epitope: NFTISVTTEILPV)		
	Coverage	Average hit	pc90
Australia	35.16%	0.38	0.15
Austria	70.86%	0.88	0.34
Belgium	46.86%	0.47	0.19
Brazil	46.15%	0.52	0.19
China	42.50%	0.5	0.17
England	57.87%	0.65	0.24
France	57.26%	0.69	0.23
Germany	60.38%	0.7	0.25
Iran	58.71%	0.73	0.24
Italy	61.45%	0.78	0.26
Korea; South	63.85%	0.84	0.28
Portugal	57.71%	0.69	0.24
Spain	58.69%	0.68	0.24
Sweden	50.90%	0.55	0.2
Turkey	44.80%	0.45	0.18
United States	57.96%	0.68	0.24
Average	54.44	0.64	0.23
Standard deviation	8.9	0.14	0.05

Country	HLA-I (A*02:01, A*02:03, A*02:06, A*03:01, A*11:01, A*23:01, A*24:02, B*08:01, B*15:01) (Epitope: GYLQPRTFLLKY)		
	Coverage	Average hit	pc90
Australia	81.10%	1.13	0.53
Austria	85.58%	1.3	0.69
Belgium	85.61%	1.26	0.7
Brazil	67.28%	0.85	0.31
China	83.20%	1.17	0.6
England	89.22%	1.45	0.93
France	82.21%	1.22	0.56
Germany	89.89%	1.45	0.99
Iran	75.10%	1	0.4
Italy	74.41%	0.99	0.39
Korea; South	85.94%	1.27	0.71
Portugal	80.70%	1.12	0.52
Spain	61.83%	0.73	0.26

Sweden	95.44%	1.68	1.14
Turkey	44.80%	0.45	0.18
United States	82.50%	1.16	0.57
Average	79.05	1.14	0.59
Standard deviation	12.03	0.29	0.26

Country	HLA-I (A*01:01, A*02:03, A*26:01, A*30:02, A*68:02, B*15:01) (Epitope: YTNSFTRGVYY)		
	Coverage	Average hit	pc90
Australia	20.38%	0.21	0.13
Austria	54.61%	0.65	0.22
Belgium	32.10%	0.33	0.15
Brazil	28.10%	0.3	0.14
China	29.95%	0.33	0.14
England	49.46%	0.56	0.2
France	46.98%	0.54	0.19
Germany	45.38%	0.52	0.18
Iran	19.18%	0.2	0.12
Italy	41.57%	0.45	0.17
Korea; South	31.30%	0.35	0.15
Portugal	29.27%	0.32	0.14
Spain	4.08%	0.04	0.1
Sweden	42.92%	0.49	0.18
Turkey	0.00%	0	0.1
United States	31.80%	0.35	0.15
Average	31.69	0.35	0.15
Standard deviation	14.91	0.18	0.03

Country	HLA-I (B*35:01, B*51:01, B*53:01, B*57:01) (Epitope: FLPFNSNVTWF)		
	Coverage	Average hit	pc90
Australia	6.58%	0.07	0.11
Austria	28.77%	0.3	0.14
Belgium	3.96%	0.04	0.1
Brazil	17.21%	0.18	0.12
China	13.24%	0.14	0.12
England	22.73%	0.24	0.13
France	28.12%	0.3	0.14
Germany	28.31%	0.3	0.14
Iran	45.68%	0.5	0.18
Italy	45.62%	0.49	0.18
Korea; South	25.10%	0.26	0.13
Portugal	30.65%	0.32	0.14
Spain	33.69%	0.36	0.15
Sweden	16.38%	0.17	0.12
United States	30.35%	0.32	0.14
Average	25.09	0.27	0.14
Standard deviation	11.79	0.13	0.02

Country	HLA-I (A*23:01, A*24:02, B*44:02, B*44:03) (Epitope: EQYIKWPWYIW)		
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	Coverage	Average hit	pc90
Australia	43.52%	0.47	0.18
Austria	38.28%	0.44	0.16
Belgium	31.13%	0.35	0.15
Brazil	30.71%	0.34	0.14
China	27.18%	0.28	0.14
England	40.60%	0.47	0.17
France	41.15%	0.48	0.17
Germany	38.88%	0.45	0.16
Iran	13.30%	0.14	0.12
Italy	29.14%	0.32	0.14
Korea; South	49.35%	0.56	0.2
Portugal	44.81%	0.53	0.18
Spain	19.67%	0.21	0.12
Sweden	41.43%	0.46	0.17
United States	40.96%	0.47	0.17
Average	35.34	0.4	0.16
Standard deviation	9.59	0.12	0.02
Country	HLA-I (A*30:02, A*23:01, A*24:02, B*58:01, B*35:01, B*15:01)		
	(Epitope: VYSSANNCTFEY)		
	Coverage	Average hit	pc90
Australia	45.42%	0.5	0.18
Austria	39.78%	0.46	0.17
Belgium	18.64%	0.19	0.12
Brazil	35.02%	0.4	0.15
China	42.60%	0.5	0.17
England	33.33%	0.38	0.15
France	43.22%	0.51	0.18
Germany	43.39%	0.51	0.18
Iran	33.60%	0.38	0.15
Italy	47.75%	0.57	0.19
Korea; South	61.81%	0.79	0.26
Portugal	43.26%	0.51	0.18
Spain	13.91%	0.14	0.12
Sweden	56.07%	0.69	0.23
United States	49.63%	0.6	0.2
Average	40.5	0.48	0.18
Standard deviation	12.11	0.16	0.04
Country	HLA-I (A*03:01, A*11:01, A*30:02, A*68:01, B*57:01, B*58:01)		
	(Epitope: CTLKSFTVEKGIY)		
	Coverage	Average hit	pc90
Australia	35.47%	0.39	0.15
Austria	40.06%	0.44	0.17
Belgium	51.72%	0.59	0.21
Brazil	38.96%	0.43	0.16
China	51.87%	0.57	0.21
England	46.36%	0.53	0.19
France	44.48%	0.52	0.18

Germany	48.52%	0.56	0.19
Iran	50.31%	0.59	0.2
Italy	44.28%	0.51	0.18
Korea; South	33.08%	0.36	0.15
Portugal	39.27%	0.44	0.16
Spain	20.34%	0.22	0.13
Sweden	57.34%	0.62	0.23
United States	39.56%	0.45	0.17
Average	42.77	0.48	0.18
Standard deviation	8.86	0.1	0.03

^a, projected population coverage. ^b, Average number of epitope hits / HLA combinations recognized by the population. ^c, Minimum number of epitope hits / HLA combinations recognized by 90% of the population.

Table S9. Population coverage analysis for the predicted CD4⁺ T-cell epitopes in the most-affected countries by COVID-19.

Country	HLA-II (DRB1*01:01) (Epitope: YRVVVLSEFLLHAPATVCGPKKS)		
	Coverage	Average hit	pc90
Australia	1.44%	0.01	0.1
Austria	22.74%	0.23	0.13
Belgium	16.46%	0.16	0.12
Brazil	3.92%	0.04	0.1
Canada	2.25%	0.02	0.1
China	2.77%	0.03	0.1
England	16.88%	0.17	0.12
France	15.11%	0.15	0.12
Germany	18.65%	0.19	0.12
Iran	10.23%	0.1	0.11
Italy	1.45%	0.01	0.1
Korea; South	12.54%	0.13	0.11
Portugal	9.09%	0.09	0.11
Spain	10.43%	0.1	0.11
Sweden	16.05%	0.16	0.12
Turkey	8.99%	0.09	0.11
United States	13.62%	0.14	0.12
Average	10.74	0.11	0.11

Standard deviation	6.4	0.07	0.01
Country	HLA-II (DRB1*13:02; DRB3*01:01; DRB3*02:02) (Epitope: HFPREGVVFVSNQTHWFVTQRNF)		
	Coverage	Average hit	pc90
Austria	12.02%	0.12	0.11
Belgium	6.88%	0.07	0.11
Brazil	3.54%	0.04	0.1
Canada	1.12%	0.01	0.1
China	3.43%	0.03	0.1
England	6.31%	0.06	0.11
France	9.17%	0.09	0.11
Germany	8.22%	0.08	0.11
Iran	3.61%	0.04	0.1
Italy	0.92%	0.01	0.1
Korea; South	17.74%	0.18	0.12
Portugal	6.55%	0.07	0.11
Spain	7.01%	0.07	0.11
Sweden	7.09%	0.07	0.11
Turkey	9.75%	0.1	0.11
United States	8.34%	0.08	0.11
Average	6.98	0.07	0.11
Standard deviation	4.07	0.04	0.01
Country	HLA-II (DRB1*01:01; DRB1*11:01) (Epitope: MFVFLVLLPLVSSQCVNLT)		
	Coverage	Average hit	pc90
Australia	1.44%	0.01	0.1
Austria	37.75%	0.4	0.16
Belgium	28.94%	0.3	0.14
Brazil	10.17%	0.1	0.11
Canada	4.47%	0.04	0.1
China	9.39%	0.09	0.11
England	25.04%	0.26	0.13
France	26.03%	0.27	0.14
Germany	31.35%	0.33	0.15
Iran	26.89%	0.28	0.14
Italy	4.86%	0.05	0.11
Korea; South	19.76%	0.2	0.12
Portugal	18.33%	0.19	0.12
Spain	20.84%	0.21	0.13
Sweden	30.68%	0.32	0.14
Turkey	27.75%	0.29	0.14
United States	23.75%	0.25	0.13
Average	20.44	0.21	0.13
Standard deviation	10.42	0.11	0.02
Country	HLA-II (DRB1*09:01; DRB1*01:01) (Epitope: TITSGWTFGAGAALQIPFAMQ)		
	Coverage	Average hit	pc90

Australia	1.44%	0.01	0.1
Austria	24.14%	0.24	0.13
Belgium	16.46%	0.16	0.12
Brazil	10.56%	0.11	0.11
Canada	2.25%	0.02	0.1
China	17.86%	0.18	0.12
England	19.19%	0.19	0.12
France	15.68%	0.16	0.12
Germany	20.39%	0.21	0.13
Iran	10.91%	0.11	0.11
Italy	1.81%	0.02	0.1
Korea; South	29.61%	0.31	0.14
Portugal	11.86%	0.12	0.11
Spain	11.58%	0.12	0.11
Sweden	37.10%	0.39	0.16
Turkey	8.99%	0.09	0.11
United States	18.57%	0.19	0.12
Average	15.2	0.15	0.12
Standard deviation	9.3	0.1	0.02
HLA-II (DRB1*03:01; DRB3*01:01)			
(Epitope: SKHTPINLVRDLPQGFSALEP)			
Country	Coverage	Average hit	pc90
Australia	6.38%	0.06	0.11
Austria	22.21%	0.22	0.13
Belgium	28.94%	0.29	0.14
Brazil	11.24%	0.11	0.11
Canada	4.45%	0.04	0.1
China	6.30%	0.06	0.11
England	25.32%	0.25	0.13
France	23.93%	0.24	0.13
Germany	20.52%	0.21	0.13
Iran	18.61%	0.19	0.12
Italy	59.99%	0.6	0.25
Korea; South	4.89%	0.05	0.11
Portugal	19.21%	0.19	0.12
Spain	19.21%	0.19	0.12
Sweden	14.39%	0.14	0.12
Turkey	17.55%	0.18	0.12
United States	21.82%	0.22	0.13
Average	19.12	0.19	0.13
Standard deviation	12.55	0.13	0.03
HLA-II (DRB1*04:05)			
(Epitope: FGGFNFSQILPDPSK)			
Country	Coverage	Average hit	pc90
Australia	4.94%	0.05	0.11
Belgium	2.98%	0.03	0.1

Brazil	1.64%	0.02	0.1
Canada	1.12%	0.01	0.1
China	6.15%	0.06	0.11
England	1.87%	0.02	0.1
France	2.66%	0.03	0.1
Germany	0.64%	0.01	0.1
Iran	1.69%	0.02	0.1
Italy	24.31%	0.24	0.13
Korea; South	15.74%	0.16	0.12
Portugal	4.08%	0.04	0.1
Spain	3.73%	0.04	0.1
Sweden	0.68%	0.01	0.1
Turkey	3.57%	0.04	0.1
United States	1.22%	0.01	0.1
Average	4.81	0.05	0.1
Standard deviation	6.13	0.06	0.01
Country	HLA-II (DRB1*04:01) (Epitope: ALNTLVKQLSSNFGAIS)		
	Coverage	Average hit	pc90
Australia	0.72%	0.01	0.1
Austria	13.14%	0.13	0.12
Belgium	11.83%	0.12	0.11
Brazil	2.27%	0.02	0.1
Canada	1.12%	0.01	0.1
China	1.92%	0.02	0.1
England	22.67%	0.23	0.13
France	18.87%	0.19	0.12
Germany	15.52%	0.16	0.12
Iran	0.40%	0	0.1
Italy	2.44%	0.02	0.1
Korea; South	1.29%	0.01	0.1
Portugal	5.08%	0.05	0.11
Spain	4.55%	0.05	0.1
Sweden	14.73%	0.15	0.12
Turkey	3.96%	0.04	0.1
United States	15.54%	0.16	0.12
Average	8	0.08	0.11
Standard deviation	7.17	0.07	0.01
Country	HLA-II (DRB1*15:01)		

(Epitope: LTDEMIAQYTSALLAGT)			
	Coverage	Average hit	pc90
Australia	6.38%	0.06	0.11
Austria	23.79%	0.24	0.13
Brazil	3.46%	0.03	0.1
Canada	5.60%	0.06	0.11
China	12.96%	0.13	0.11
England	27.35%	0.27	0.14
France	21.23%	0.21	0.13
Germany	27.01%	0.27	0.14
Iran	8.58%	0.09	0.11
Italy	1.41%	0.01	0.1
Korea; South	14.90%	0.15	0.12
Portugal	14.16%	0.14	0.12
Spain	18.19%	0.18	0.12
Sweden	19.87%	0.2	0.12
Turkey	12.39%	0.12	0.11
United States	22.86%	0.23	0.13
Average	15.01	0.15	0.12
Standard deviation	8.07	0.08	0.01
HLA-II (DRB1*04:05; DRB1*15:01)			
(Epitope: VQPTESIVRFPNITNLCPFG)			
Country	Coverage	Average hit	pc90
Australia	11.16%	0.11	0.11
Austria	23.79%	0.24	0.13
Belgium	2.98%	0.03	0.1
Brazil	5.06%	0.05	0.11
Canada	6.68%	0.07	0.11
China	18.69%	0.19	0.12
England	28.94%	0.29	0.14
France	23.59%	0.24	0.13
Germany	27.55%	0.28	0.14
Iran	10.20%	0.1	0.11
Italy	25.54%	0.26	0.13
Korea; South	29.37%	0.31	0.14
Portugal	17.94%	0.18	0.12
Spain	21.55%	0.22	0.13
Sweden	20.47%	0.21	0.13
Turkey	15.73%	0.16	0.12

United States	23.93%	0.24	0.13
Average	18.42	0.19	0.12
Standard deviation	8.21	0.08	0.01
Country	HLA-II (DRB1*04:01; DRB3*02:02)		
	(Epitope: DLFLPFFSNVTWFHAI)		
	Coverage	Average hit	pc90
Australia	0.72%	0.01	0.1
Austria	13.14%	0.13	0.12
Belgium	11.83%	0.12	0.11
Brazil	2.27%	0.02	0.1
Canada	1.12%	0.01	0.1
China	1.92%	0.02	0.1
England	22.67%	0.23	0.13
France	18.87%	0.19	0.12
Germany	15.52%	0.16	0.12
Iran	0.40%	0	0.1
Italy	2.44%	0.02	0.1
Korea; South	1.29%	0.01	0.1
Portugal	5.08%	0.05	0.11
Spain	4.55%	0.05	0.1
Sweden	14.73%	0.15	0.12
Turkey	3.96%	0.04	0.1
United States	15.54%	0.16	0.12
Average	8.0	0.08	0.11
Standard deviation	7.17	0.07	0.01
Country	HLA-II (DRB1*11:01)		
	(Epitope: KVGGNYNLYRLFRKSNLKPFER)		
	Coverage	Average hit	pc90
Austria	17.19%	0.17	0.12
Belgium	13.70%	0.14	0.12
Brazil	6.37%	0.06	0.11
Canada	2.25%	0.02	0.1
China	6.72%	0.07	0.11
England	8.97%	0.09	0.11
France	11.89%	0.12	0.11
Germany	14.14%	0.14	0.12
Iran	17.63%	0.18	0.12
Italy	3.43%	0.03	0.1
Korea; South	7.73%	0.08	0.11
Portugal	9.70%	0.1	0.11
Spain	11.02%	0.11	0.11
Sweden	16.03%	0.16	0.12
Turkey	19.72%	0.2	0.12
United States	10.92%	0.11	0.11
Average	11.09	0.11	0.11
Standard deviation	4.95	0.05	0.01

Country	HLA-II (DRB1*07:01) (Epitope: IAIPNFTISVTTEILPVSMT)		
	Coverage	Average hit	pc90
Australia	5.68%	0.06	0.11
Austria	25.00%	0.25	0.13
Belgium	20.97%	0.21	0.13
Brazil	10.67%	0.11	0.11
China	8.26%	0.08	0.11
England	25.65%	0.26	0.13
France	19.97%	0.2	0.12
Germany	22.69%	0.23	0.13
Iran	14.43%	0.14	0.12
Italy	11.72%	0.12	0.11
Korea; South	12.82%	0.13	0.11
Portugal	28.10%	0.28	0.14
Spain	29.07%	0.29	0.14
Sweden	5.55%	0.06	0.11
Turkey	17.19%	0.17	0.12
United States	19.84%	0.2	0.12
Average	17.35	0.17	0.12
Standard deviation	7.49	0.07	0.01
Country	HLA-II (DRB1*09:01) (Epitope: KCVNFNENGLTGTGVLTES)		
	Coverage	Average hit	pc90
Austria	1.59%	0.02	0.1
Brazil	6.78%	0.07	0.11
China	15.31%	0.15	0.12
England	2.54%	0.03	0.1
France	0.62%	0.01	0.1
Germany	1.93%	0.02	0.1
Iran	0.72%	0.01	0.1
Italy	0.36%	0	0.1
Korea; South	18.31%	0.18	0.12
Portugal	2.90%	0.03	0.1
Spain	1.22%	0.01	0.1
Sweden	23.12%	0.23	0.13
United States	5.33%	0.05	0.11
Average	6.21	0.06	0.11
Standard deviation	7.34	0.07	0.01
Country	HLA-II (DRB1*15:01) (Epitope: ECSNLLLQYGSFCTQLNR)		
	Coverage	Average hit	pc90
Australia	6.38%	0.06	0.11

Austria	23.79%	0.24	0.13
Brazil	3.46%	0.03	0.1
Canada	5.60%	0.06	0.11
China	12.96%	0.13	0.11
England	27.35%	0.27	0.14
France	21.23%	0.21	0.13
Germany	27.01%	0.27	0.14
Iran	8.58%	0.09	0.11
Italy	1.41%	0.01	0.1
Korea; South	14.90%	0.15	0.12
Portugal	14.16%	0.14	0.12
Spain	18.19%	0.18	0.12
Sweden	19.87%	0.2	0.12
Turkey	12.39%	0.12	0.11
United States	22.86%	0.23	0.13
Average	15.01	0.15	0.12
Standard deviation	8.07	0.08	0.01
HLA-II (DRB1*13:02)			
(Epitope: GNCDVVIGIVNNTVYDPL)			
Country	Coverage	Average hit	pc90
Austria	12.02%	0.12	0.11
Belgium	6.88%	0.07	0.11
Brazil	3.54%	0.04	0.1
Canada	1.12%	0.01	0.1
China	3.43%	0.03	0.1
England	6.31%	0.06	0.11
France	9.17%	0.09	0.11
Germany	8.22%	0.08	0.11
Iran	3.61%	0.04	0.1
Italy	0.92%	0.01	0.1
Korea; South	17.74%	0.18	0.12
Portugal	6.55%	0.07	0.11
Spain	7.01%	0.07	0.11
Sweden	7.09%	0.07	0.11
Turkey	9.75%	0.1	0.11
United States	8.34%	0.08	0.11
Average	6.98	0.07	0.11
Standard deviation	4.07	0.04	0.01
HLA-II (DRB1*04:01; DRB1*13:02; DRB3*02:02)			

(Epitope: TLDSKTQSLIVNNAATNVVIVKVFCEQF)			
	Coverage	Average hit	pc90
Australia	0.72%	0.01	0.1
Austria	24.31%	0.25	0.13
Belgium	18.28%	0.19	0.12
Brazil	5.77%	0.06	0.11
Canada	2.23%	0.02	0.1
China	5.32%	0.05	0.11
England	28.21%	0.29	0.14
France	27.10%	0.28	0.14
Germany	23.06%	0.24	0.13
Iran	4.00%	0.04	0.1
Italy	3.35%	0.03	0.1
Korea; South	18.91%	0.19	0.12
Portugal	11.46%	0.12	0.11
Spain	11.40%	0.12	0.11
Sweden	21.27%	0.22	0.13
Turkey	13.51%	0.14	0.12
United States	23.19%	0.24	0.13
Average	14.24	0.15	0.12
Standard deviation	9.16	0.1	0.01
HLA-II (DRB1*01:01; DRB1*15:01; DRB5*01:01)			
(Epitope: IGINITRFQTLALHRSYLTP)			
	Coverage	Average hit	pc90
Australia	7.77%	0.08	0.11
Austria	43.45%	0.47	0.18
Belgium	16.46%	0.16	0.12
Brazil	7.31%	0.07	0.11
Canada	7.78%	0.08	0.11
China	15.54%	0.16	0.12
England	41.62%	0.44	0.17
France	34.57%	0.36	0.15
Germany	42.80%	0.46	0.17
Iran	18.34%	0.19	0.12
Italy	2.86%	0.03	0.1
Korea; South	26.44%	0.27	0.14
Portugal	22.57%	0.23	0.13
Spain	27.59%	0.29	0.14
Sweden	34.16%	0.36	0.15

Turkey	20.79%	0.21	0.13
United States	34.76%	0.36	0.15
Average	23.81	0.25	0.14
Standard deviation	12.87	0.14	0.02