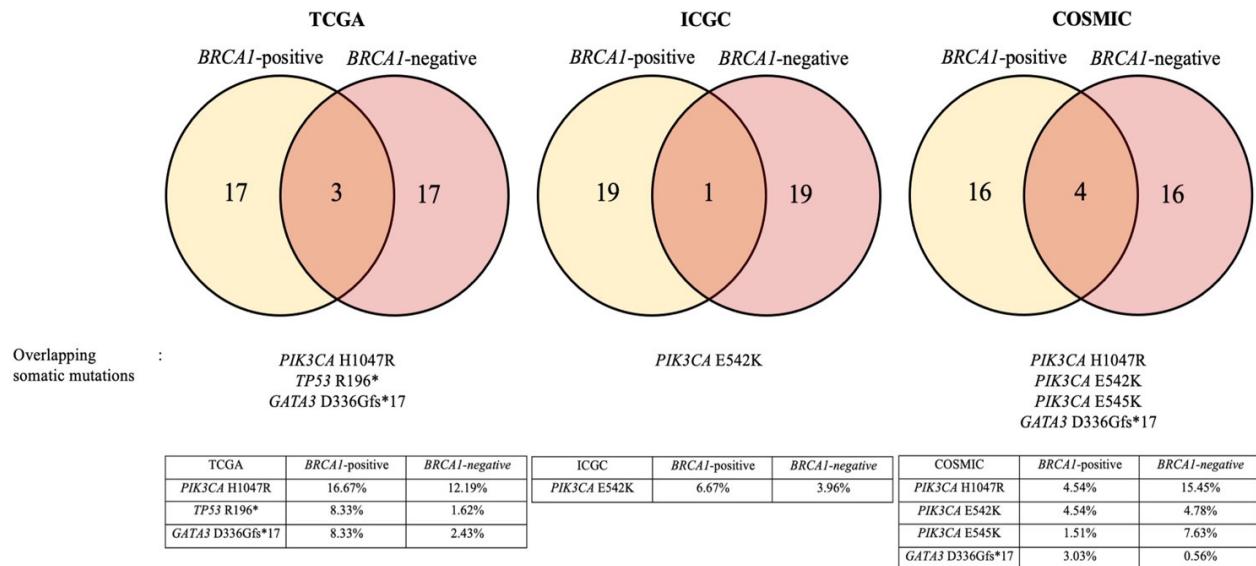


Supplementary Figure S1. Overlapping top 20 recurrent somatic mutations identified in *BRCA1*-positive and *BRCA1*-negative groups. The somatic mutations on the lists and in the tables are the overlapped recurrent somatic mutations from both subgroups. Its corresponding frequency (percentage of sample harboring the somatic mutation in all *BRCA1*-positive samples or *BRCA1*-negative samples) are also shown in the table for each database.



Supplementary Table S1. Sample characteristics of germline *BRCA1*-mutated breast cancer studies and sample IDs of the samples included in this study.

	Nik-Zanial et al. 2016	Nones et al. 2019	Inagaki-Kawata et al. 2020
Samples	31	26	21
Analysis type	WGS	WGS	Target sequencing of 115 genes associated with breast cancer
Platform	Illumina Hiseq 2000/2500	Illumina X-Ten	SureSelect system (Agilent)
Raw data available at	EGAS00001001178 (the European-Genome Phenome Archive)	EGAS00001003305 (the European-Genome Phenome Archive)	EGAS00001004630, EGAS00001004182 (the European-Genome Phenome Archive)
Sample IDs	PD24202a PD8621a PD13296a PD24337a PD9702a PD6406a PD9004a PD3905a PD24186a PD4005a PD13771a PD13297a PD5935a PD11327a PD10014a PD3890a PD5930a PD8980a PD14442a PD4006a PD13299a PD4107a PD23562a PD5945a PD22355a PD23574a PD23578a PD6413a PD6731a2 PD5948a PD13627a	FBC108061 FBC110004 FBC110062 FBC112021 FBC208006 FBC712007 FBC406015 FBC016026 FBC020030 FBC061126 FBC020187 FBC070197 FBC100739 FBC020675 FBC070890 FBC060097 FBC060467 FBC020034 FBC070205 FBC060031 FBC020091 FBC030130 FBC061699 FBC071015 FBC080607 FBC090326	TCGA-D8-A1XK TCGA-D8-A1XQ TCGA-AR-A24Q TCGA-AO-A124 TCGA-A7-A4SE TCGA-D8-A147 TCGA-C8-A12K TCGA-E2-A14N TCGA-E9-A244 TCGA-E9-A22G TCGA-A1-A0SH TCGA-E9-A22E TCGA-E2-A14Z TCGA-EW-A1P4 TCGA-E2-A1IJ TCGA-BH-A0BL KU045 KU016 KU014 KU009 KU085

Supplementary Table S2. *BRCA1*-positive and -negative sample IDs from TCGA, ICGC and COSMIC databases.

TCGA: *BRCA1*- positive

Sample ID	DNA Change(BRCA1 mutation)	BRCA1 mutation type	ACMG prediction	GRCh
TCGA-BH-A0WA	chr17:g.43071239C>T	Splice Acceptor BRCA1 X1580_splice	pathogenic	38
TCGA-A1-A0SI	chr17:g.43124016C>T	Splice Donor BRCA1 X27_splice	pathogenic	38
TCGA-A2-A25B	chr17:g.43093373C>A	Stop Gained BRCA1 E720*	pathogenic	38
TCGA-A1-A0SH	chr17:g.43092731G>A	Stop Gained BRCA1 Q934*	pathogenic	38
TCGA-A7-A6VW	chr17:g.43092822delA	Frameshift BRCA1 C903Wfs*97	pathogenic	38
TCGA-A7-A26H	chr17:g.43093467delTGTC	Frameshift BRCA1 T688Vfs*12	pathogenic	38
TCGA-LL-A8F5	chr17:g.43082539G>A	Stop Gained BRCA1 Q1408*	pathogenic	38
TCGA-A8-A06X	chr17:g.43094717C>A	Stop Gained BRCA1 E272*	pathogenic	38
TCGA-B6-A0X1	chr17:g.43124030delC	Frameshift BRCA1 E23Sfs*8	pathogenic	38
05BR052	chr17:g.43092073delA	Frameshift BRCA1 L1153Rfs*2	pathogenic	38
TCGA-E9-A1NC	chr17:g.43104148G>A	Stop Gained BRCA1 Q139*	pathogenic	38
TCGA-D8-A27M	chr17:g.43071073delG	Frameshift BRCA1 P1635Qfs*19	likely pathogenic	38
TCGA-AN-A0XU	chr17:g.43049164C>A	Missense BRCA1 G1809V	pathogenic	38

ICGC: *BRCA1*- positive

Sample ID	DNA change (BRCA1 mutation)	ACMG prediction	GRCh
DO225079	chr17:g.41234451G>A	Pathogenic	37
DO224917	chr17:g.41246005C>A	Pathogenic	37
DO225334	chr17:g.41247865->T	Likely Pathogenic	37
DO225328	chr17:g.41215381T>C	Likely Pathogenic	37
DO218669	chr17:g.41209130T>A	Pathogenic	37
DO1261	chr17:g.41244748G>A	Pathogenic	37
DO1712	chr17:g.41201181C>A	Pathogenic	37
DO2020	chr17:g.41276033C>T	Pathogenic	37
DO3916	chr17:g.41244185->T	Likely Pathogenic	37
DO50068	chr17:g.41234556G>A	Pathogenic	37
DO51226	chr17:g.41243563C>A	Pathogenic	37
DO5074	chr17:g.41246734C>A	Pathogenic	37
DO5130	chr17:g.41199695T>A	Likely Pathogenic	37
DO2897	chr17:g.41223256C>T	Pathogenic	37
DO2706	chr17:g.41245390C>A	Pathogenic	37

Comsic: *BRCA1*- positive

Sample ID	AA change (BRCA1 mutation)	CDS Mutation	ACMG prediction	GRCh
1509149	p.E515*	c.1543G>T	pathogenic	38
1527353	p.D1760V	c.5279A>T	pathogenic	38
1649378	p.R1443*	c.4327C>T	pathogenic	38
1660108	p.?	c.135-1215C>G	pathogenic	38
1768176	p.F1793Lfs*29	c.5356_5378dup	pathogenic	38
1779256	p.Q934*	c.2800C>T	pathogenic	38
1779260	p.?	c.80+1G>A	pathogenic	38
1779502	p.N1121Kfs*12	c.3362dup	likely pathogenic	38
1779649	p.?	c.4739-1G>A	pathogenic	38
1899647	p.E720*	c.2158G>T	pathogenic	38
1899672	p.E272*	c.814G>T	pathogenic	38
1899768	p.G1809V	c.5426G>T	pathogenic	38
1899917	p.Q1832L	c.5495A>T	likely pathogenic	38
1900097	p.P1635Qfs*19	c.4904del	likely pathogenic	38
2199791	p.Q1742R	c.5225A>G	likely pathogenic	38
2213140	p.A224Gfs*4	c.668dup	likely pathogenic	38
2262906	p.Q1408*	c.4222C>T	pathogenic	38
2318501	p.S1817Lfs*34	c.5448_5449insC	likely pathogenic	38
2339544	p.E1329*	c.3985G>T	pathogenic	38
2579117	p.D1526Mfs*43	c.4575del	likely pathogenic	38
2657324	p.E1419*	c.4255G>T	pathogenic	38
2662750	p.R1747Kfs*5	c.5240_5241del	pathogenic	38
2673932	p.C61Y	c.182G>A	pathogenic	38
2697837	p.R1610C	c.4828C>T	pathogenic	38
2697863	p.W1836*	c.5507G>A	pathogenic	38
2724995	p.R71Kfs*10	c.211dup	pathogenic	38
2725854	p.G911Efs*89	c.2732del	likely pathogenic	38
2726190	p.K1745*	c.5233A>T	pathogenic	38
2767653	p.E1250*	c.3748G>T	pathogenic	38
2767723	p.E1752Q	c.5254G>C	likely pathogenic	38
2768049	p.G928Afs*72	c.2783del	pathogenic	38
2768180	p.R1856Q	c.5567G>A	likely pathogenic	38
2768268	p.K608Ifs*3	c.1823_1826del	pathogenic	38
2768429	p.N1355Kfs*10	c.4065_4068del	pathogenic	38
2768438	p.P1635Qfs*19	c.4904del	likely pathogenic	38
2768457	p.G948Efs*52	c.2838del	likely pathogenic	38
2768460	p.Y655Vfs*18	c.1961dup	pathogenic	38
2768485	p.L1086Dfs*2	c.3254_3255dup	pathogenic	38
2768525	p.K339Rfs*2	c.1016del	pathogenic	38

2768553	p.C1372Efs*2	c.4113_4117del	pathogenic	38
2768554	p.N714Kfs*4	c.2141dup	likely pathogenic	38
2768560	p.H437*	c.1308_1309del	likely pathogenic	38
2768689	p.N1029Kfs*3	c.3087_3088del	likely pathogenic	38
2768761	p.K894Tfs*8	c.2681_2682del	pathogenic	38
2768773	p.V340Gfs*6	c.1016dup	pathogenic	38
2768791	p.Q169*	c.505C>T	pathogenic	38
2768816	p.Y1584Tfs*38	c.4750del	likely pathogenic	38
2768819	p.M1804T	c.5411T>C	likely pathogenic	38
2768830	p.W372Yfs*5	c.1115_1116del	likely pathogenic	38
2768838	p.Q172Nfs*62	c.514del	pathogenic	38
2768840	p.R1443*	c.4327C>T	pathogenic	38
2768848	p.C1718R	c.5152T>C	pathogenic	38
2768851	p.E453Rfs*22	c.1357del	likely pathogenic	38
2768862	p.R1203*	c.3607C>T	pathogenic	38
2768869	p.H1284Tfs*23	c.3850del	likely pathogenic	38
2768880	p.Q1395*	c.4183C>T	pathogenic	38
2802997	p.Q12_V14delinsH	c.36_41del	likely pathogenic	38
2810731	p.R1856*	c.5566C>T	pathogenic	38
2810741	p.E1115*	c.3342_3345del	pathogenic	38
2823388	p.T1249P	c.3745A>C	pathogenic	38
2823406	p.E23Vfs*17	c.68_69del	pathogenic	38
2823407	p.Q1777Pfs*74	c.5329dup	pathogenic	38
2823443	p.E881*	c.2641G>T	pathogenic	38
2823472	p.E1282Afs*26	c.3844_3845insCG	likely pathogenic	38
2823478	p.Q1832R	c.5495A>G	pathogenic	38
2830181	p.R71Kfs*10	c.211dup	pathogenic	38

TCGA: *BRCA1*- negative

Sample ID				
TCGA-A8-A0AD	TCGA-B6-A0WV	TCGA-E2-A155	TCGA-C8-A26V	TCGA-B6-A0IN
TCGA-B6-A0RV	TCGA-C8-A12L	TCGA-AR-A250	TCGA-A8-A09D	TCGA-EW-A1OX
TCGA-AC-A23H	TCGA-AN-A0FW	TCGA-E9-A228	TCGA-S3-AA14	TCGA-EW-A2FV
TCGA-A8-A08L	TCGA-D8-A1X9	TCGA-OL-A5RZ	TCGA-A7-A13D	TCGA-LL-A6FP
TCGA-A8-A09I	TCGA-B6-A0IO	TCGA-C8-A275	TCGA-E9-A226	TCGA-AC-A2B8
TCGA-A2-A0EV	TCGA-BH-A0B1	TCGA-EW-A1OV	TCGA-BH-A1EV	TCGA-BH-A42T
TCGA-AR-A1AP	TCGA-BH-A0H7	TCGA-C8-A1HN	TCGA-A8-A085	TCGA-D8-A27G
TCGA-BH-A1F0	TCGA-C8-A135	TCGA-BH-A0BF	TCGA-OL-A6VO	TCGA-LQ-A4E4
TCGA-A7-A13G	TCGA-E2-A109	TCGA-EW-A1OZ	TCGA-AO-A12C	TCGA-AC-A2FB
TCGA-E2-A14W	TCGA-A2-A0YG	TCGA-BH-A0AW	TCGA-EW-A2FS	TCGA-A2-A0SY
TCGA-BH-A203	TCGA-EW-A1OY	TCGA-AN-A0FY	TCGA-E2-A1LB	TCGA-A8-A09X
TCGA-A1-A0SM	TCGA-B6-A0IK	TCGA-C8-A138	TCGA-E2-A1L7	TCGA-EW-A1J3
TCGA-BH-A0BP	TCGA-BH-A0C0	TCGA-A7-A4SF	TCGA-E9-A1RB	TCGA-EW-A6SC
TCGA-A8-A090	TCGA-D8-A140	TCGA-A2-A0EO	TCGA-A1-A0SJ	TCGA-D8-A27T
TCGA-AC-A5XU	TCGA-D8-A1JG	TCGA-A7-A2KD	TCGA-EW-A1J1	TCGA-A7-A426
TCGA-LD-A9QF	TCGA-BH-A0DX	TCGA-E2-A14T	TCGA-A7-A0D9	TCGA-AC-A6IX
TCGA-A2-A0CU	TCGA-AN-A0AT	TCGA-C8-A130	TCGA-C8-A1HO	TCGA-A2-A4RW
TCGA-BH-A0BW	TCGA-B6-A0I9	TCGA-AN-A04C	TCGA-AO-A03L	TCGA-B6-A0IE
TCGA-E2-A1LE	TCGA-A2-A1FW	TCGA-AR-A254	TCGA-A2-A04X	TCGA-PL-A8LV
TCGA-OL-A5D6	TCGA-AC-A23C	TCGA-BH-A18R	TCGA-AO-A03M	TCGA-AC-A2QH
TCGA-A2-A259	TCGA-EW-A1PD	TCGA-B6-A0IG	TCGA-AR-A0TQ	TCGA-A7-A26G
TCGA-LL-A7T0	TCGA-A8-A08F	TCGA-BH-A0W7	TCGA-C8-A1HF	TCGA-C8-A1HL
TCGA-A8-A09C	TCGA-AN-A0FJ	TCGA-BH-A0E2	TCGA-C8-A273	TCGA-A8-A08J
TCGA-B6-A1KF	TCGA-AO-A0JL	TCGA-A8-A092	TCGA-AO-A0JG	
TCGA-A2-A0CW	TCGA-A2-A4S3	TCGA-BH-A18V	TCGA-AO-A0J5	

ICGC: *BRCA1*- negative

Sample ID							
DO218489	DO227809	DO5801	DO1247	DO3799	DO217934	DO227943	DO224763
DO218488	DO2281	DO4515	DO2575	DO1136	DO1722	DO227944	DO5326
DO218478	DO2275	DO5843	DO44105	DO3388	DO217908	DO227945	DO5312
DO218457	DO227815	DO5836	DO227521	DO2055	DO1727	DO2389	DO224781
DO218428	DO227817	DO4509	DO44103	DO3382	DO1707	DO227947	DO224788
DO218419	DO227820	DO4503	DO44109	DO3376	DO1702	DO227948	DO5305
DO218404	DO2264	DO5829	DO44107	DO2043	DO1767	DO227949	DO224798
DO218408	DO2269	DO5822	DO1237	DO2049	DO1761	DO2383	DO5368
DO218502	DO3590	DO5815	DO1239	DO3370	DO1755	DO227950	DO4036
DO218583	DO227830	DO5884	DO2569	DO4695	DO1743	DO225306	DO4038
DO218560	DO227846	DO3221	DO44101	DO2032	DO1749	DO225305	DO4030
DO218553	DO227854	DO4551	DO2563	DO3364	DO217887	DO225304	DO5361
DO220824	DO227857	DO4557	DO1231	DO2037	DO1732	DO225303	DO4024
DO220826	DO227862	DO3215	DO3892	DO3352	DO1737	DO225302	DO5354
DO220825	DO225207	DO5877	DO1233	DO4683	DO217865	DO225301	DO4012
DO220820	DO225206	DO4545	DO3898	DO3358	DO1792	DO225300	DO4018
DO220822	DO225205	DO5870	DO1235	DO4689	DO1797	DO225309	DO5347
DO220821	DO225203	DO3209	DO227529	DO2026	DO1780	DO225308	DO5340
DO220828	DO225202	DO5863	DO227535	DO2090	DO1786	DO225307	DO5333
DO220827	DO225201	DO3200	DO1227	DO2096	DO1773	DO225317	DO4006
DO218621	DO227860	DO3204	DO1229	DO2084	DO228502	DO225316	DO4000
DO218611	DO225200	DO4533	DO2557	DO2078	DO228506	DO225315	DO4080
DO218605	DO225208	DO4527	DO2551	DO2072	DO228509	DO225314	DO4074
DO218698	DO225177	DO5857	DO1221	DO2067	DO228516	DO225312	DO4068
DO218684	DO225176	DO4521	DO3880	DO3394	DO228521	DO225311	DO4062
DO218656	DO225175	DO5850	DO1223	DO2061	DO1402	DO225310	DO224700
DO218651	DO225174	DO3269	DO3886	DO4713	DO1406	DO225319	DO224709
DO218742	DO225173	DO4599	DO1225	DO4719	DO2737	DO225320	DO5389
DO218736	DO225172	DO3263	DO1215	DO4707	DO2731	DO225327	DO4056
DO218719	DO225171	DO4593	DO1217	DO4701	DO2725	DO225326	DO5382
DO229483	DO225170	DO4587	DO1219	DO225331	DO2719	DO225325	DO4050
DO218796	DO4914	DO3257	DO1211	DO225330	DO2713	DO225324	DO224717
DO218770	DO225179	DO3251	DO2545	DO225339	DO2712	DO225323	DO224713
DO1808	DO225178	DO4581	DO1213	DO225338	DO2700	DO225321	DO4044
DO228283	DO225180	DO4575	DO3874	DO225336	DO1449	DO1098	DO5375
DO1802	DO225188	DO3245	DO1284	DO225333	DO2777	DO225329	DO224722

DO228290	DO225187	DO3239	DO1287	DO225332	DO1440	DO1090	DO224728
DO228293	DO225186	DO4563	DO1286	DO3424	DO2770	DO1092	DO224732
DO228295	DO225185	DO4569	DO1289	DO4756	DO2776	DO1094	DO224730
DO1842	DO225183	DO5898	DO1288	DO225342	DO1445	DO1096	DO224737
DO1848	DO225182	DO5891	DO1281	DO225341	DO1436	DO227903	DO224741
DO1836	DO225181	DO3299	DO1280	DO4749	DO2761	DO227909	DO224746
DO1830	DO4907	DO3293	DO1283	DO225344	DO2764	DO225298	DO4092
DO1820	DO225189	DO3287	DO1282	DO4743	DO1434	DO225297	DO4098
DO1826	DO225191	DO3281	DO227561	DO3412	DO2755	DO3709	DO224755
DO1814	DO225190	DO3275	DO1274	DO225353	DO1429	DO225296	DO4086
DO1885	DO225199	DO5928	DO1273	DO225352	DO217962	DO225295	DO5403
DO1872	DO225198	DO5920	DO1275	DO225351	DO1414	DO225294	DO224887
DO1873	DO225197	DO5912	DO1278	DO225350	DO2749	DO225293	DO224885
DO1866	DO225196	DO5905	DO1277	DO3406	DO1419	DO225292	DO5445
DO1860	DO225194	DO3305	DO1279	DO4737	DO217953	DO225291	DO4116
DO1854	DO3626	DO5960	DO1270	DO225359	DO217952	DO3703	DO4110
DO228247	DO3620	DO4635	DO1272	DO225358	DO2743	DO225299	DO224897
DO228246	DO3614	DO4629	DO1271	DO225356	DO1486	DO3745	DO224895
DO218828	DO4942	DO4623	DO1263	DO225355	DO1481	DO2419	DO224892
DO228256	DO4935	DO4617	DO1262	DO225354	DO1473	DO2413	DO5431
DO218827	DO3602	DO5944	DO1265	DO3400	DO1476	DO2407	DO4104
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DO228262	DO4928	DO5936	DO1264	DO225364	DO2794	DO2401	DO5417
DO228268	DO4921	DO4677	DO1267	DO225363	DO1464	DO3733	DO44273
DO228272	DO1007	DO3346	DO2599	DO225362	DO2796	DO3727	DO44272
DO228276	DO1009	DO4671	DO1266	DO225360	DO2788	DO3721	DO44270
DO1927	DO3668	DO3340	DO1269	DO4725	DO1459	DO3715	DO5486
DO1922	DO1008	DO2008	DO1268	DO225369	DO2783	DO225210	DO4155
DO1926	DO3662	DO2002	DO1260	DO225368	DO1454	DO1128	DO44268
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DO1914	DO4991	DO3334	DO1252	DO225366	DO1497	DO1127	DO44266
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DO1966	DO1004	DO3328	DO1253	DO225374	DO227507	DO1129	DO5479
DO1960	DO225100	DO5984	DO1256	DO225373	DO2819	DO225214	DO5472
DO1954	DO225108	DO3322	DO1255	DO225372	DO2813	DO225213	DO44258
DO1943	DO2329	DO4647	DO1258	DO225371	DO2808	DO225212	DO44256
DO1948	DO225104	DO3317	DO1257	DO225370	DO2802	DO227871	DO44250
DO1932	DO225103	DO3311	DO2587	DO225379	DO227470	DO225211	DO5465
DO1937	DO225102	DO5976	DO2581	DO225378	DO2854	DO1120	DO4134

DO228328	DO225101	DO4233	DO1250	DO225377	DO1527	DO1121	DO4138
DO228321	DO3650	DO5563	DO1295	DO225376	DO227475	DO3787	DO44248
DO50070	DO3656	DO4239	DO1297	DO3464	DO1522	DO1123	DO44246
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DO1996	DO2323	DO4221	DO1290	DO4794	DO1512	DO225219	DO44243
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DO50064	DO225111	DO5556	DO1291	DO2137	DO1517	DO225220	DO5459
DO50066	DO227776	DO5549	DO1293	DO225386	DO2848	DO2449	DO4128
DO1990	DO2317	DO4215	DO227719	DO225385	DO2842	DO225229	DO5452
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DO50062	DO225118	DO5535	DO227749	DO225383	DO227494	DO225227	DO224805
DO228340	DO4977	DO224560	DO3904	DO225382	DO2836	DO1118	DO4191
DO228345	DO225116	DO224565	DO225056	DO225381	DO2831	DO225226	DO4197
DO50054	DO225115	DO4275	DO225054	DO225380	DO2825	DO225225	DO224811
DO50056	DO225113	DO224577	DO225051	DO225389	DO1569	DO227881	DO224818
DO50058	DO225112	DO5597	DO3946	DO225387	DO2891	DO225223	DO224815
DO1984	DO227773	DO4269	DO225059	DO3454	DO1564	DO225222	DO4185
DO50050	DO4970	DO5590	DO225058	DO2120	DO1550	DO1110	DO224824
DO228350	DO3644	DO4263	DO2617	DO3458	DO2885	DO1112	DO4173
DO228352	DO2311	DO224582	DO2611	DO4787	DO1555	DO2443	DO224833
DO1978	DO225122	DO224588	DO3940	DO2125	DO2879	DO1114	DO4167
DO228356	DO225121	DO224585	DO225067	DO4780	DO1547	DO3775	DO224839
DO50043	DO225120	DO4257	DO225065	DO225397	DO2870	DO225232	DO224835
DO50045	DO227787	DO5583	DO225063	DO225396	DO2874	DO225231	DO4161
DO50047	DO3638	DO4251	DO225061	DO225395	DO1537	DO225230	DO5493
DO50048	DO225129	DO224590	DO3934	DO225394	DO2866	DO1106	DO224844
DO1972	DO225128	DO224598	DO2605	DO225393	DO2860	DO1105	DO224841
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2717110	2767918	2768727	2829271	2830848	2829812	2903329	
2717129	2767919	2768728	2829273	2830849	2829813	2903330	
2717156	2767920	2768729	2829276	2830850	2829816	2903331	
2717165	2767921	2768730	2829280	2830851	2829819	2903332	
2717250	2767922	2768731	2829283	2830852	2829824	2903333	
2717254	2767923	2768732	2829285	2830853	2829827	2903334	
2717316	2767924	2768733	2829286	2830854	2829828	2903335	

2717327	2767925	2768734	2829287	2830855	2829829	2903336
2717371	2767926	2768735	2829291	2830856	2829830	2903337
2717373	2767927	2768736	2829292	2830857	2829831	2903338
2717375	2767928	2768737	2829299	2830858	2829837	2903339
2717382	2767929	2768738	2829301	2830859	2829838	2903340
2717386	2767930	2768739	2829302	2830860	2829841	2903341
2717422	2767931	2768742	2829303	2830861	2829848	2903342
2717493	2767932	2768743	2829306	2830862	2829850	2903343
2717538	2767933	2768744	2829310	2830863	2829851	2903344
2717559	2767934	2768745	2829314	2830864	2829853	2903345
2717601	2767935	2768746	2829322	2830866	2829860	2903346
2717628	2767936	2768747	2829323	2830867	2829867	2903347

Supplementary Table S3. Median and p-value of non-synonymous variant from Mann-Whitney U test of all databases.

Type of counts	BRCA1- positive (median)	BRCA1- negative (median)	p-value (2-tailed)
TCGA			
Total variant count	83.50 (Q ₁ 59.75-Q ₃ 140.25)	39.00 (Q ₁ 22.00-Q ₃ 65.00)	<0.001
SNV count	80.00 (Q ₁ 53.00-Q ₃ 137.25)	36.00 (Q ₁ 19.00-Q ₃ 56.00)	<0.001
Indel count	5.50 (Q ₁ 2.00-Q ₃ 9.00)	3.00 (Q ₁ 1.00-Q ₃ 4.00)	0.019
ICGC			
Total variant count	95.00 (Q ₁ 66.00-Q ₃ 140.00)	36.00 (Q ₁ 23.00-Q ₃ 62.00)	<0.001
SNV count	91.00 (Q ₁ 63.00-Q ₃ 139.00)	34.00 (Q ₁ 22.00-Q ₃ 60.00)	<0.001
Indel count	2.00 (Q ₁ 0.00-Q ₃ 6.00)	1.00 (Q ₁ 0.00-Q ₃ 2.00)	0.032
Cosmic			
Total variant count	6.50 (Q ₁ 4.00-Q ₃ 8.00)	2.00 (Q ₁ 1.00-Q ₃ 2.00)	<0.001
SNV count	5.00 (Q ₁ 2.50-Q ₃ 7.00)	1.00 (Q ₁ 1.00-Q ₃ 2.00)	<0.001
Indel count	1.00 (Q ₁ 0.00-Q ₃ 2.00)	0.00 (Q ₁ 0.00-Q ₃ 1.00)	0.031

Supplementary Table S4. Binding prediction results between epitopes of recurrent somatic mutation and MHC class II.

Somatic mutation	Allele	Peptide	Length	Method	Adjusted percentile rank	IC50	Allele/Haplotype frequency (%)
PIK3CA E542K	HLA-DRB1*07:01	KQEKFDFLWSHRHYCV	15	Consensus	8.3	-	12.21
PIK3CA E545K	HLA-DPA1*01:03/DPB1*04:01	KQEKFDFLWSHRHYCVTI	17	NetMHCIIpan	44.28	881.39	17.41
	HLA-DPA1*01:03/DPB1*04:01	KQEKFDFLWSHRHYCVTIP	18	NetMHCIIpan	85.83	904.49	17.41
	HLA-DPA1*01:03/DPB1*04:01	TKQEKDFLWSHRHYCVTI	18	NetMHCIIpan	82.87	875.65	17.41
PIK3CA H1047R	HLA-DRB1*04:01	ALEYFMKQMNDAHRG	14	Consensus	4.85	-	6.37
	HLA-DRB1*04:01	ALEYFMKQMNDAHRG	15	Consensus	5.2	-	6.37
	HLA-DRB3*02:02	ALEYFMKQMNDAHRG	15	NetMHCIIpan	14	850.37	16.40
	HLA-DRB1*04:01	ALEYFMKQMNDAHRG	16	Consensus	6.93	-	6.37
	HLA-DRB3*02:02	ALEYFMKQMNDAHRG	16	NetMHCIIpan	17.31	936.09	16.40
	HLA-DRB1*04:01	EALEYFMKQMNDAHRG	15	Consensus	5.2	-	6.37
	HLA-DRB1*04:01	EALEYFMKQMNDAHRG	16	Consensus	6.93	-	6.37
	HLA-DRB3*02:02	EALEYFMKQMNDAHRG	16	NetMHCIIpan	18.47	989.67	16.40
HLA-DPA1*01:03/DPB1*04:01	EQEALEYFMKQMNDAHRG	17	NetMHCIIpan	28.96	537.46	17.41	
HLA-DPA1*01:03/DPB1*04:01	EQEALEYFMKQMNDAHRG	18	NetMHCIIpan	59.19	581.18	17.41	
	HLA-DRB1*04:01	EYFMKQMNDAHRG	12	Consensus	8.9	-	6.37
	HLA-DRB1*04:01	EYFMKQMNDAHRG	13	Consensus	6.08	-	6.37
	HLA-DRB1*04:01	EYFMKQMNDAHRG	14	Consensus	4.85	-	6.37
	HLA-DRB3*02:02	EYFMKQMNDAHRG	15	Consensus	5.2	-	6.37
	HLA-DRB1*04:01	EYFMKQMNDAHRGWT	16	NetMHCIIpan	15	929.56	16.40
	HLA-DRB1*04:01	EYFMKQMNDAHRGWT	16	Consensus	6.93	-	6.37
	HLA-DRB3*01:01	HRGWTTKMDWIFHT	15	Consensus	9.1	-	18.00
	HLA-DRB1*04:01	LEYFMKQMNDAHRG	13	Consensus	6.08	-	6.37
	HLA-DRB1*04:01	LEYFMKQMNDAHRG	14	Consensus	4.85	-	6.37
	HLA-DRB3*02:02	LEYFMKQMNDAHRG	14	NetMHCIIpan	12.92	960.74	16.40
	HLA-DRB1*04:01	LEYFMKQMNDAHRG	15	Consensus	5.2	-	6.37
	HLA-DRB3*02:02	LEYFMKQMNDAHRG	15	NetMHCIIpan	14	842.99	16.40
	HLA-DRB1*04:01	LEYFMKQMNDAHRG	16	Consensus	6.93	-	6.37
	HLA-DRB3*02:02	LEYFMKQMNDAHRG	16	NetMHCIIpan	16.16	864.52	16.40
HLA-DPA1*01:03/DPB1*04:01	QEAELEYFMKQMNDAHRG	16	NetMHCIIpan	21.93	703.46	17.41	
	HLA-DRB1*04:01	QEAELEYFMKQMNDAHRG	16	Consensus	6.93	-	6.37
HLA-DPA1*01:03/DPB1*04:01	QEAELEYFMKQMNDAHRG	17	NetMHCIIpan	39.17	790.95	17.41	
HLA-DPA1*01:03/DPB1*04:01	QEAELEYFMKQMNDAHRG	18	NetMHCIIpan	79.91	831.41	17.41	
	HLA-DRB3*01:01	RGGWTTKMDWIFHT	14	Consensus	7.97	-	18.00
	HLA-DRB3*01:01	RGGWTTKMDWIFHT	15	Consensus	7.6	-	18.00
HLA-DPA1*01:03/DPB1*04:01	RGWTTKMDWIFHTIKQH	18	NetMHCIIpan	85.83	902.16	17.41	
HLA-DPA1*01:03/DPB1*04:01	TEQEAELEYFMKQMNDAHRG	18	NetMHCIIpan	47.35	466.35	17.41	
	HLA-DRB1*04:01	YFMKQMNDAHRG	12	Consensus	9.79	-	6.37
	HLA-DRB1*04:01	YFMKQMNDAHRG	13	Consensus	6.08	-	6.37
	HLA-DRB1*04:01	YFMKQMNDAHRG	14	Consensus	4.85	-	6.37
	HLA-DRB1*04:01	YFMKQMNDAHRGWT	15	Consensus	5.8	-	6.37
	HLA-DRB1*04:01	YFMKQMNDAHRGWT	16	Consensus	8.43	-	6.37
PIK3CA N345K	HLA-DRB1*01:01	ALRIKILCATYY	12	Consensus	2.43	-	7.54
	HLA-DRB1*08:02	ALRIKILCATYY	12	Consensus	5.63	-	0.68
	HLA-DRB1*01:01	ALRIKILCATYYVK	13	Consensus	2.03	-	7.54
	HLA-DRB1*07:01	ALRIKILCATYYVK	13	Consensus	5.61	-	12.21
	HLA-DRB1*08:02	ALRIKILCATYYVK	13	Consensus	4.52	-	0.68
	HLA-DRB1*12:01	ALRIKILCATYYVK	13	Consensus	1.72	-	1.97
	HLA-DRB1*13:02	ALRIKILCATYYVK	13	Consensus	8.73	-	4.60
	HLA-DRB1*15:01	ALRIKILCATYYVK	13	Consensus	2.49	-	11.16
	HLA-DRB3*02:02	ALRIKILCATYYVK	13	NetMHCIIpan	11.23	985.45	16.40
	HLA-DRB4*01:01	ALRIKILCATYYVK	13	Consensus	6.39	-	28.00
	HLA-DRB5*01:01	ALRIKILCATYYVK	13	Consensus	7.48	-	16.10
HLA-DPA1*01:03/DPB1*02:01	ALRIKILCATYYVKV	14	Consensus	7.32	-	15.31	
HLA-DPA1*01:03/DPB1*04:01	ALRIKILCATYYVKV	14	NetMHCIIpan	3.77	281.81	17.41	
	HLA-DRB1*01:01	ALRIKILCATYYVKV	14	Consensus	1.72	-	7.54
	HLA-DRB1*04:05	ALRIKILCATYYVKV	14	Consensus	9.58	-	1.16
	HLA-DRB1*07:01	ALRIKILCATYYVKV	14	Consensus	4.2	-	12.21
	HLA-DRB1*08:02	ALRIKILCATYYVKV	14	Consensus	4.2	-	0.68
	HLA-DRB1*12:01	ALRIKILCATYYVKV	14	Consensus	1.56	-	1.97
	HLA-DRB1*13:02	ALRIKILCATYYVKV	14	Consensus	5.38	-	4.60
	HLA-DRB1*15:01	ALRIKILCATYYVKV	14	Consensus	1.94	-	11.16
	HLA-DRB3*02:02	ALRIKILCATYYVKV	14	NetMHCIIpan	7.32	549.59	16.40
	HLA-DRB4*01:01	ALRIKILCATYYVKV	14	Consensus	5.49	-	28.00
	HLA-DRB5*01:01	ALRIKILCATYYVKV	14	Consensus	6.25	-	16.10
HLA-DPA1*01:03/DPB1*02:01	ALRIKILCATYYVKVN	15	Consensus	8.2	-	15.31	
HLA-DPA1*01:03/DPB1*04:01	ALRIKILCATYYVKVN	15	NetMHCIIpan	4.5	229.91	17.41	
HLA-DPA1*02:01/DPB1*14:01	ALRIKILCATYYVKVN	15	NetMHCIIpan	4.2	923.04	11.59	
	HLA-DRB1*01:01	ALRIKILCATYYVKVN	15	Consensus	2	-	7.54
	HLA-DRB1*04:05	ALRIKILCATYYVKVN	15	Consensus	8.9	-	1.16
	HLA-DRB1*07:01	ALRIKILCATYYVKVN	15	Consensus	5.4	-	12.21
	HLA-DRB1*08:02	ALRIKILCATYYVKVN	15	Consensus	5.1	-	0.68
	HLA-DRB1*12:01	ALRIKILCATYYVKVN	15	Consensus	1.9	-	1.97
	HLA-DRB1*13:02	ALRIKILCATYYVKVN	15	Consensus	5.7	-	4.60
	HLA-DRB1*15:01	ALRIKILCATYYVKVN	15	Consensus	2.7	-	11.16
	HLA-DRB3*02:02	ALRIKILCATYYVKVN	15	NetMHCIIpan	9.1	560.67	16.40
	HLA-DRB4*01:01	ALRIKILCATYYVKVN	15	Consensus	6.4	-	28.00
	HLA-DRB5*01:01	ALRIKILCATYYVKVN	15	Consensus	7.1	-	16.10
HLA-DPA1*01:03/DPB1*04:01	ALRIKILCATYYVKVN	16	NetMHCIIpan	5.08	192.35	17.41	
HLA-DPA1*02:01/DPB1*14:01	ALRIKILCATYYVKVN	16	NetMHCIIpan	6.12	759.96	11.59	
	HLA-DRB1*01:01	ALRIKILCATYYVKVN	16	Consensus	3.46	-	7.54
	HLA-DRB1*07:01	ALRIKILCATYYVKVN	16	Consensus	7.96	-	12.21
	HLA-DRB1*08:02	ALRIKILCATYYVKVN	16	Consensus	7.62	-	0.68

HLA-DRB1*12:01	ALRIKILCATYVKVNI	16	Consensus	2.89	-	1.97
HLA-DRB1*13:02	ALRIKILCATYVKVNI	16	Consensus	7.5	-	4.60
HLA-DRB1*15:01	ALRIKILCATYVKVNI	16	Consensus	4.73	-	11.16
HLA-DRB3*02:02	ALRIKILCATYVKVNI	16	NetMHCIIpan	13.85	723.59	16.40
HLA-DRB4*01:01	ALRIKILCATYVKVNI	16	Consensus	8.43	-	28.00
HLA-DPA1*01:03/DPB1*04:01	ALRIKILCATYVKVNIR	17	NetMHCIIpan	9.54	212.59	17.41
HLA-DPA1*02:01/DPB1*14:01	ALRIKILCATYVKVNIR	17	NetMHCIIpan	11.07	715.8	11.59
HLA-DRB1*01:01	ALRIKILCATYVKVNIR	17	Consensus	5.96	-	7.54
HLA-DRB1*12:01	ALRIKILCATYVKVNIR	17	Consensus	5.71	-	1.97
HLA-DRB1*15:01	ALRIKILCATYVKVNIR	17	Consensus	9.71	-	11.16
HLA-DRB3*02:02	ALRIKILCATYVKVNIR	17	NetMHCIIpan	22.14	883.35	16.40
HLA-DPA1*01:03/DPB1*04:01	ALRIKILCATYVKVNIRD	18	NetMHCIIpan	21.01	236.3	17.41
HLA-DPA1*02:01/DPB1*14:01	ALRIKILCATYVKVNIRD	18	NetMHCIIpan	25.16	760.5	11.59
HLA-DRB1*04:01	ATPYMNGETSTKS	13	Consensus	5.61	-	6.37
HLA-DRB1*04:01	ATPYMNGETSTKSL	14	Consensus	4.52	-	6.37
HLA-DRB1*04:01	ATPYMNGETSTKSLW	15	Consensus	4.7	-	6.37
HLA-DRB1*04:01	ATPYMNGETSTKSLWV	16	Consensus	6.35	-	6.37
HLA-DRB1*01:01	ETSTKSLWVINSALRI	16	Consensus	6.81	-	7.54
HLA-DRB1*08:02	ETSTKSLWVINSALRI	16	Consensus	3.58	-	0.68
HLA-DRB1*15:01	ETSTKSLWVINSALRI	16	Consensus	5.43	-	11.16
HLA-DRB5*01:01	ETSTKSLWVINSALRI	16	Consensus	6.81	-	16.10
HLA-DRB1*08:02	ETSTKSLWVINSALRIK	17	Consensus	5.96	-	0.68
HLA-DRB1*12:01	ETSTKSLWVINSALRIK	17	Consensus	7.83	-	1.97
HLA-DRB1*15:01	ETSTKSLWVINSALRIK	17	Consensus	9.03	-	11.16
HLA-DRB1*12:01	ETSTKSLWVINSALRIKI	18	Consensus	9.62	-	1.97
HLA-DRB3*01:01	ETSTKSLWVINSALRIKI	18	Consensus	9.77	-	18.00
HLA-DRB1*08:02	FTMPSYSRISTATP	15	Consensus	8.9	-	0.68
HLA-DRB1*08:02	GETSTKSLWVINSALRI	17	Consensus	5.96	-	0.68
HLA-DRB1*15:01	GETSTKSLWVINSALRI	17	Consensus	9.2	-	11.16
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVN	12	NetMHCIIpan	8.9	751	17.41
HLA-DPA1*01:03/DPB1*02:01	IKILCATYVKVNI	13	Consensus	9.67	-	15.31
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVNI	13	NetMHCIIpan	5.3	451.81	17.41
HLA-DRB1*01:01	IKILCATYVKVNI	13	Consensus	8.73	-	7.54
HLA-DRB1*07:01	IKILCATYVKVNI	13	Consensus	8.11	-	12.21
HLA-DRB1*15:01	IKILCATYVKVNI	13	Consensus	8.11	-	11.16
HLA-DPA1*01:03/DPB1*02:01	IKILCATYVKVNI	14	NetMHCIIpan	8.29	-	15.31
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVNI	14	NetMHCIIpan	4.74	340.4	17.41
HLA-DRB1*01:01	IKILCATYVKVNI	14	Consensus	7.97	-	7.54
HLA-DRB1*07:01	IKILCATYVKVNI	14	Consensus	7.65	-	12.21
HLA-DRB1*15:01	IKILCATYVKVNI	14	Consensus	8.51	-	11.16
HLA-DPA1*01:03/DPB1*02:01	IKILCATYVKVNIRD	15	Consensus	9.4	-	15.31
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVNIRD	15	NetMHCIIpan	6.5	307.43	17.41
HLA-DRB1*01:01	IKILCATYVKVNIRD	15	Consensus	9.3	-	7.54
HLA-DRB1*07:01	IKILCATYVKVNIRD	15	Consensus	9.7	-	12.21
HLA-DPA1*01:03/DPB1*02:01	IKILCATYVKVNIRD	16	Consensus	9.93	-	15.31
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVNIRD	16	NetMHCIIpan	9.7	314.87	17.41
HLA-DRB1*01:01	IKILCATYVKVNIRD	16	Consensus	4.39	-	7.54
HLA-DRB1*07:01	IKILCATYVKVNIRD	16	Consensus	4.27	-	12.21
HLA-DRB1*09:01	IKILCATYVKVNIRD	16	Consensus	0.91	-	1.68
HLA-DRB1*11:01	IKILCATYVKVNIRD	16	Consensus	7.85	-	4.25
HLA-DRB1*13:02	IKILCATYVKVNIRD	16	Consensus	4.85	-	4.60
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVNIRDID	17	NetMHCIIpan	20.44	373.3	17.41
HLA-DRB1*01:01	IKILCATYVKVNIRDID	17	Consensus	7.49	-	7.54
HLA-DRB1*07:01	IKILCATYVKVNIRDID	17	Consensus	7.15	-	12.21
HLA-DPA1*01:03/DPB1*02:01	IKILCATYVKVNIRD	16	Consensus	9.93	-	15.31
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVNIRD	16	NetMHCIIpan	9.7	314.87	17.41
HLA-DRB1*01:01	IKILCATYVKVNIRD	16	Consensus	4.39	-	7.54
HLA-DRB1*07:01	IKILCATYVKVNIRD	16	Consensus	4.27	-	12.21
HLA-DRB1*09:01	IKILCATYVKVNIRD	16	Consensus	0.91	-	1.68
HLA-DRB1*11:01	IKILCATYVKVNIRD	16	Consensus	7.85	-	4.25
HLA-DRB1*13:02	IKILCATYVKVNIRD	16	Consensus	4.85	-	4.60
HLA-DPA1*01:03/DPB1*04:01	IKILCATYVKVNIRDID	17	NetMHCIIpan	41.44	407.26	17.41
HLA-DRB1*09:01	IKILCATYVKVNIRDID	18	Consensus	3.26	-	1.68
HLA-DRB1*13:02	IKILCATYVKVNIRDID	16	Consensus	8.31	-	4.60
HLA-DRB1*01:01	INSALRIKILCATYV	15	Consensus	2.2	-	7.54
HLA-DRB1*08:02	INSALRIKILCATYV	15	Consensus	4	-	0.68
HLA-DRB1*13:02	INSALRIKILCATYV	15	Consensus	8.2	-	4.60
HLA-DPA1*01:03/DPB1*04:01	INSALRIKILCATYV	16	NetMHCIIpan	21.93	708.94	17.41
HLA-DQA1*01:02/DQB1*06:02	INSALRIKILCATYV	16	Consensus	3.12	-	10.40
HLA-DRB1*01:01	INSALRIKILCATYV	16	Consensus	3.69	-	7.54
HLA-DRB1*07:01	INSALRIKILCATYV	16	Consensus	8.43	-	12.21
HLA-DRB1*08:02	INSALRIKILCATYV	16	Consensus	6.58	-	0.68
HLA-DRB1*12:01	INSALRIKILCATYV	16	Consensus	3.12	-	1.97
HLA-DRB1*15:01	INSALRIKILCATYV	16	Consensus	5.66	-	11.16
HLA-DRB4*01:01	INSALRIKILCATYV	16	Consensus	6.58	-	28.00
HLA-DPA1*01:03/DPB1*04:01	INSALRIKILCATYV	17	NetMHCIIpan	11.41	243.57	17.41
HLA-DPA1*02:01/DPB1*14:01	INSALRIKILCATYV	17	NetMHCIIpan	13.29	808.99	11.59
HLA-DQA1*01:02/DQB1*06:02	INSALRIKILCATYV	17	Consensus	6.81	-	10.40
HLA-DRB1*01:01	INSALRIKILCATYV	17	Consensus	5.62	-	7.54
HLA-DRB1*12:01	INSALRIKILCATYV	17	Consensus	5.19	-	1.97
HLA-DRB1*15:01	INSALRIKILCATYV	17	Consensus	8.52	-	11.16
HLA-DPA1*01:03/DPB1*04:01	INSALRIKILCATYV	18	NetMHCIIpan	23.97	257.86	17.41
HLA-DPA1*02:01/DPB1*14:01	INSALRIKILCATYV	18	NetMHCIIpan	26.05	779.32	11.59
HLA-DRB1*12:01	INSALRIKILCATYV	18	Consensus	9.17	-	1.97
HLA-DRB1*04:01	INSTATPYMNGETSTKS	16	Consensus	6.35	-	6.37
HLA-DPA1*01:03/DPB1*04:01	KILCATYVKVNI	12	NetMHCIIpan	10.38	850.18	17.41
HLA-DPA1*01:03/DPB1*04:01	KILCATYVKVNIR	13	NetMHCIIpan	7.64	641.18	17.41
HLA-DPA1*01:03/DPB1*04:01	KILCATYVKVNIRD	14	NetMHCIIpan	7.65	536.93	17.41
HLA-DPA1*01:03/DPB1*04:01	KILCATYVKVNIRDID	15	NetMHCIIpan	8.8	419.01	17.41
HLA-DPA1*01:03/DPB1*04:01	KILCATYVKVNIRDID	16	NetMHCIIpan	15.01	450.34	17.41
HLA-DRB1*13:02	KILCATYVKVNIRDID	16	Consensus	8.31	-	4.60
HLA-DPA1*01:03/DPB1*04:01	KILCATYVKVNIRDIDK	17	NetMHCIIpan	27.25	510.13	17.41
HLA-DPA1*01:03/DPB1*04:01	KILCATYVKVNIRDIDK	18	NetMHCIIpan	56.23	528.01	17.41
HLA-DRB1*01:01	KSLWVINSALRI	12	Consensus	8.9	-	7.54
HLA-DRB1*08:02	KSLWVINSALRI	12	Consensus	5.34	-	0.68
HLA-DRB1*03:01	KSLWVINSALRIKI	14	Consensus	9.15	-	9.82
HLA-DRB1*11:01	KSLWVINSALRIKI	14	Consensus	3.98	-	4.25
HLA-DRB1*11:01	KSLWVINSALRIKIL	15	Consensus	4.1	-	4.25

HLA-DRB1*08:02	KSLWVINSALRIKILC	16	Consensus	3.58	-	0.68
HLA-DRB1*11:01	KSLWVINSALRIKILC	16	Consensus	7.16	-	4.25
HLA-DRB1*08:02	KSLWVINSALRIKILCA	17	Consensus	5.96	-	0.68
HLA-DRB1*15:01	KSLWVINSALRIKILCA	17	Consensus	8.01	-	11.16
HLA-DRB1*08:02	KSLWVINSALRIKILCAT	18	Consensus	5.62	-	0.68
HLA-DRB3*01:01	KSLWVINSALRIKILCAT	18	Consensus	9.47	-	18.00
HLA-DRB1*03:01	KVNIRDIDKIYVR	13	Consensus	9.82	-	9.82
HLA-DRB1*03:01	KVNIRDIDKIYVRT	14	Consensus	8.61	-	9.82
HLA-DRB1*03:01	KVNIRDIDKIYVRTG	15	Consensus	9.9	-	9.82
HLA-DRB1*11:01	KVNIRDIDKIYVRTG	15	Consensus	8.7	-	4.25
HLA-DRB1*01:01	LRIKILCATYVK	12	Consensus	2.58	-	7.54
HLA-DRB1*07:01	LRIKILCATYVK	12	Consensus	8.3	-	12.21
HLA-DRB1*08:02	LRIKILCATYVK	12	Consensus	8.01	-	0.68
HLA-DRB1*12:01	LRIKILCATYVK	12	Consensus	2.39	-	1.97
HLA-DRB1*15:01	LRIKILCATYVK	12	Consensus	3.26	-	11.16
HLA-DPA1*01:03/DPB1*02:01	LRIKILCATYVKV	13	Consensus	8.42	-	15.31
HLA-DPA1*01:03/DPB1*04:01	LRIKILCATYVKV	13	NetMHCIIpan	4.21	377.53	17.41
HLA-DRB1*01:01	LRIKILCATYVKV	13	Consensus	2.03	-	7.54
HLA-DRB1*07:01	LRIKILCATYVKV	13	Consensus	4.68	-	12.21
HLA-DRB1*08:02	LRIKILCATYVKV	13	Consensus	6.24	-	0.68
HLA-DRB1*12:01	LRIKILCATYVKV	13	Consensus	2.11	-	1.97
HLA-DRB1*13:02	LRIKILCATYVKV	13	Consensus	6.71	-	4.60
HLA-DRB1*15:01	LRIKILCATYVKV	13	Consensus	2.03	-	11.16
HLA-DRB3*02:02	LRIKILCATYVKV	13	NetMHCIIpan	7.8	679.95	16.40
HLA-DRB4*01:01	LRIKILCATYVKV	13	Consensus	7.48	-	28.00
HLA-DRB5*01:01	LRIKILCATYVKV	13	Consensus	7.33	-	16.10
HLA-DPA1*01:03/DPB1*02:01	LRIKILCATYVKVN	14	Consensus	7.11	-	15.31
HLA-DPA1*01:03/DPB1*04:01	LRIKILCATYVKVN	14	NetMHCIIpan	3.77	286.69	17.41
HLA-DRB1*01:01	LRIKILCATYVKVN	14	Consensus	1.94	-	7.54
HLA-DRB1*04:05	LRIKILCATYVKVN	14	Consensus	8.51	-	1.16
HLA-DRB1*07:01	LRIKILCATYVKVN	14	Consensus	4.63	-	12.21
HLA-DRB1*08:02	LRIKILCATYVKVN	14	Consensus	5.92	-	0.68
HLA-DRB1*12:01	LRIKILCATYVKVN	14	Consensus	1.88	-	1.97
HLA-DRB1*13:02	LRIKILCATYVKVN	14	Consensus	5.38	-	4.60
HLA-DRB1*15:01	LRIKILCATYVKVN	14	Consensus	2.15	-	11.16
HLA-DRB3*02:02	LRIKILCATYVKVN	14	NetMHCIIpan	7	533.12	16.40
HLA-DRB4*01:01	LRIKILCATYVKVN	14	Consensus	7.43	-	28.00
HLA-DRB5*01:01	LRIKILCATYVKVN	14	Consensus	6.35	-	16.10
HLA-DPA1*01:03/DPB1*02:01	LRIKILCATYVKVN	15	Consensus	8	-	15.31
HLA-DPA1*01:03/DPB1*04:01	LRIKILCATYVKVN	15	NetMHCIIpan	3.5	190.24	17.41
HLA-DRB1*01:01	LRIKILCATYVKVN	15	Consensus	2.2	-	7.54
HLA-DRB1*07:01	LRIKILCATYVKVN	15	Consensus	5.6	-	12.21
HLA-DRB1*08:02	LRIKILCATYVKVN	15	Consensus	7.1	-	0.68
HLA-DRB1*12:01	LRIKILCATYVKVN	15	Consensus	2.4	-	1.97
HLA-DRB1*13:02	LRIKILCATYVKVN	15	Consensus	5.7	-	4.60
HLA-DRB1*15:01	LRIKILCATYVKVN	15	Consensus	3.1	-	11.16
HLA-DRB3*02:02	LRIKILCATYVKVN	15	NetMHCIIpan	9.4	579.2	16.40
HLA-DRB4*01:01	LRIKILCATYVKVN	15	Consensus	8.2	-	28.00
HLA-DRB5*01:01	LRIKILCATYVKVN	15	Consensus	7.3	-	16.10
HLA-DPA1*01:03/DPB1*04:01	LRIKILCATYVKVNIR	16	NetMHCIIpan	5.19	195.64	17.41
HLA-DPA1*02:01/DPB1*14:01	LRIKILCATYVKVNIR	16	NetMHCIIpan	7.27	830.02	11.59
HLA-DRB1*01:01	LRIKILCATYVKVNIR	16	Consensus	3.69	-	7.54
HLA-DRB1*07:01	LRIKILCATYVKVNIR	16	Consensus	8.89	-	12.21
HLA-DRB1*08:02	LRIKILCATYVKVNIR	16	Consensus	8.89	-	0.68
HLA-DRB1*12:01	LRIKILCATYVKVNIR	16	Consensus	3.81	-	1.97
HLA-DRB1*13:02	LRIKILCATYVKVNIR	16	Consensus	7.5	-	4.60
HLA-DRB1*15:01	LRIKILCATYVKVNIR	16	Consensus	5.66	-	11.16
HLA-DRB3*02:02	LRIKILCATYVKVNIR	16	NetMHCIIpan	13.85	758.64	16.40
HLA-DPA1*01:03/DPB1*04:01	LRIKILCATYVKVNIRD	17	NetMHCIIpan	10.39	228.72	17.41
HLA-DPA1*02:01/DPB1*14:01	LRIKILCATYVKVNIRD	17	NetMHCIIpan	16.01	905.64	11.59
HLA-DRB1*01:01	LRIKILCATYVKVNIRD	17	Consensus	6.3	-	7.54
HLA-DRB1*12:01	LRIKILCATYVKVNIRD	17	Consensus	7.15	-	1.97
HLA-DPA1*01:03/DPB1*04:01	LRIKILCATYVKVNIRD	18	NetMHCIIpan	21.01	234.8	17.41
HLA-DPA1*02:01/DPB1*14:01	LRIKILCATYVKVNIRD	18	NetMHCIIpan	32.56	884.3	11.59
HLA-DRB1*09:01	LRIKILCATYVKVNIRD	18	Consensus	2.9	-	1.68
HLA-DRB1*08:02	LWVINSALRIKI	12	Consensus	5.34	-	0.68
HLA-DRB1*11:01	LWVINSALRIKI	12	Consensus	6.82	-	4.25
HLA-DRB1*08:02	LWVINSALRIKIL	13	Consensus	4.05	-	0.68
HLA-DRB1*11:01	LWVINSALRIKIL	13	Consensus	4.83	-	4.25
HLA-DRB1*03:01	LWVINSALRIKILC	14	Consensus	9.15	-	9.82
HLA-DRB1*08:02	LWVINSALRIKILC	14	Consensus	3.98	-	0.68
HLA-DRB1*11:01	LWVINSALRIKILC	14	Consensus	4.41	-	4.25
HLA-DRB1*15:01	LWVINSALRIKILC	14	Consensus	8.94	-	11.16
HLA-DRB1*08:02	LWVINSALRIKILCA	15	Consensus	4.2	-	0.68
HLA-DRB1*11:01	LWVINSALRIKILCA	15	Consensus	4.9	-	4.25
HLA-DRB1*15:01	LWVINSALRIKILCA	15	Consensus	9.6	-	11.16
HLA-DRB1*08:02	LWVINSALRIKILCAT	16	Consensus	1.96	-	0.68
HLA-DRB1*11:01	LWVINSALRIKILCAT	16	Consensus	7.04	-	4.25
HLA-DRB1*15:01	LWVINSALRIKILCAT	16	Consensus	4.85	-	11.16
HLA-DRB3*01:01	LWVINSALRIKILCAT	16	Consensus	3.23	-	18.00
HLA-DRB5*01:01	LWVINSALRIKILCAT	16	Consensus	6.81	-	16.10
HLA-DRB1*08:02	LWVINSALRIKILCATY	17	Consensus	2.9	-	0.68
HLA-DRB1*15:01	LWVINSALRIKILCATY	17	Consensus	8.35	-	11.16
HLA-DRB3*01:01	LWVINSALRIKILCATY	17	Consensus	5.45	-	18.00
HLA-DRB1*01:01	LWVINSALRIKILCATYV	18	Consensus	6.22	-	7.54
HLA-DRB1*08:02	LWVINSALRIKILCATYV	18	Consensus	3.85	-	0.68
HLA-DRB1*15:01	LWVINSALRIKILCATYV	18	Consensus	9.77	-	11.16
HLA-DRB1*08:02	MPSYSRISTATPY	14	Consensus	9.05	-	0.68
HLA-DRB1*11:01	NIRDIDKIYVRTGI	14	Consensus	8.4	-	4.25
HLA-DRB1*01:01	NSALRIKILCATY	14	Consensus	1.94	-	7.54
HLA-DRB1*08:02	NSALRIKILCATY	14	Consensus	3.55	-	0.68
HLA-DRB1*13:02	NSALRIKILCATY	14	Consensus	7.75	-	4.60
HLA-DPA1*01:03/DPB1*04:01	NSALRIKILCATY	15	NetMHCIIpan	17	796.51	17.41

HLA-DQA1*01:02/DQB1*06:02	NSALRIKILCATYVK	15	Consensus	5.1	-	10.40
HLA-DRB1*01:01	NSALRIKILCATYVK	15	Consensus	2	-	7.54
HLA-DRB1*04:05	NSALRIKILCATYVK	15	Consensus	8.9	-	1.16
HLA-DRB1*07:01	NSALRIKILCATYVK	15	Consensus	6	-	12.21
HLA-DRB1*08:02	NSALRIKILCATYVK	15	Consensus	4.1	-	0.68
HLA-DRB1*12:01	NSALRIKILCATYVK	15	Consensus	2.05	-	1.97
HLA-DRB1*13:02	NSALRIKILCATYVK	15	Consensus	8.7	-	4.60
HLA-DRB1*15:01	NSALRIKILCATYVK	15	Consensus	3.8	-	11.16
HLA-DRB4*01:01	NSALRIKILCATYVK	15	Consensus	4.6	-	28.00
HLA-DRB5*01:01	NSALRIKILCATYVK	15	Consensus	7.6	-	16.10
HLA-DPA1*01:03/DPB1*04:01	NSALRIKILCATYVK	16	NetMHCIIpan	6.46	227.42	17.41
HLA-DPA1*02:01/DPB1*14:01	NSALRIKILCATYVK	16	NetMHCIIpan	6.93	812.64	11.59
HLA-DQA1*01:02/DQB1*06:02	NSALRIKILCATYVK	16	Consensus	9.12	-	10.40
HLA-DRB1*01:01	NSALRIKILCATYVK	16	Consensus	3.46	-	7.54
HLA-DRB1*07:01	NSALRIKILCATYVK	16	Consensus	7.04	-	12.21
HLA-DRB1*08:02	NSALRIKILCATYVK	16	Consensus	7.73	-	0.68
HLA-DRB1*12:01	NSALRIKILCATYVK	16	Consensus	3.23	-	1.97
HLA-DRB1*13:02	NSALRIKILCATYVK	16	Consensus	7.5	-	4.60
HLA-DRB1*15:01	NSALRIKILCATYVK	16	Consensus	4.73	-	11.16
HLA-DRB3*02:02	NSALRIKILCATYVK	16	NetMHCIIpan	17.31	927.44	16.40
HLA-DRB4*01:01	NSALRIKILCATYVK	16	Consensus	6.81	-	28.00
HLA-DPA1*01:03/DPB1*04:01	NSALRIKILCATYVKV	17	NetMHCIIpan	11.75	249.33	17.41
HLA-DPA1*02:01/DPB1*14:01	NSALRIKILCATYVKV	17	NetMHCIIpan	12.77	788.03	11.59
HLA-DRB1*01:01	NSALRIKILCATYVKV	17	Consensus	5.96	-	7.54
HLA-DRB1*12:01	NSALRIKILCATYVKV	17	Consensus	5.19	-	1.97
HLA-DRB1*15:01	NSALRIKILCATYVKV	17	Consensus	8.86	-	11.16
HLA-DPA1*01:03/DPB1*04:01	NSALRIKILCATYVKVN	18	NetMHCIIpan	19.53	224.99	17.41
HLA-DPA1*02:01/DPB1*14:01	NSALRIKILCATYVKVN	18	NetMHCIIpan	24.86	756.1	11.59
HLA-DRB1*04:01	PYMNGETSTKSL	12	Consensus	9.49	-	6.37
HLA-DRB1*04:01	PYMNGETSTKSLW	13	Consensus	8.11	-	6.37
HLA-DRB1*04:01	PYMNGETSTKSLWV	14	Consensus	7.11	-	6.37
HLA-DRB1*04:01	PYMNGETSTKSLWVI	15	Consensus	8.6	-	6.37
HLA-DRB1*04:01	PYMNGETSTKSLWVIN	16	Consensus	6.46	-	6.37
HLA-DPA1*01:03/DPB1*04:01	RIKILCATYVK	12	NetMHCIIpan	5.63	514.7	17.41
HLA-DRB1*01:01	RIKILCATYVK	12	Consensus	5.04	-	7.54
HLA-DRB1*12:01	RIKILCATYVK	12	Consensus	6.82	-	1.97
HLA-DRB1*15:01	RIKILCATYVK	12	Consensus	3.56	-	11.16
HLA-DRB3*02:02	RIKILCATYVK	12	NetMHCIIpan	10.68	976.07	16.40
HLA-DPA1*01:03/DPB1*02:01	RIKILCATYVKVN	13	Consensus	8.89	-	15.31
HLA-DPA1*01:03/DPB1*04:01	RIKILCATYVKVN	13	NetMHCIIpan	4.68	407.54	17.41
HLA-DRB1*01:01	RIKILCATYVKVN	13	Consensus	4.21	-	7.54
HLA-DRB1*07:01	RIKILCATYVKVN	13	Consensus	7.95	-	12.21
HLA-DRB1*12:01	RIKILCATYVKVN	13	Consensus	4.83	-	1.97
HLA-DRB1*15:01	RIKILCATYVKVN	13	Consensus	2.81	-	11.16
HLA-DRB3*02:02	RIKILCATYVKVN	13	NetMHCIIpan	8.26	710.19	16.40
HLA-DPA1*01:03/DPB1*02:01	RIKILCATYVKVNII	14	Consensus	7.43	-	15.31
HLA-DPA1*01:03/DPB1*04:01	RIKILCATYVKVNII	14	NetMHCIIpan	3.23	248.03	17.41
HLA-DRB1*01:01	RIKILCATYVKVNII	14	Consensus	5.28	-	7.54
HLA-DRB1*07:01	RIKILCATYVKVNII	14	Consensus	7.11	-	12.21
HLA-DRB1*12:01	RIKILCATYVKVNII	14	Consensus	4.36	-	1.97
HLA-DRB1*15:01	RIKILCATYVKVNII	14	Consensus	2.91	-	11.16
HLA-DRB3*02:02	RIKILCATYVKVNII	14	NetMHCIIpan	7.86	593.17	16.40
HLA-DPA1*01:03/DPB1*02:01	RIKILCATYVKVNIR	15	Consensus	8.3	-	15.31
HLA-DPA1*01:03/DPB1*04:01	RIKILCATYVKVNIR	15	NetMHCIIpan	3.8	203.42	17.41
HLA-DRB1*01:01	RIKILCATYVKVNIR	15	Consensus	7.5	-	7.54
HLA-DRB1*07:01	RIKILCATYVKVNIR	15	Consensus	7.9	-	12.21
HLA-DRB1*12:01	RIKILCATYVKVNIR	15	Consensus	5.6	-	1.97
HLA-DRB1*15:01	RIKILCATYVKVNIR	15	Consensus	4.4	-	11.16
HLA-DRB3*02:02	RIKILCATYVKVNIR	15	NetMHCIIpan	11	650.26	16.40
HLA-DPA1*01:03/DPB1*04:01	RIKILCATYVKVNIRD	16	NetMHCIIpan	6.23	222.45	17.41
HLA-DPA1*02:01/DPB1*14:01	RIKILCATYVKVNIRD	16	NetMHCIIpan	9.47	979.06	11.59
HLA-DRB1*01:01	RIKILCATYVKVNIRD	16	Consensus	4.16	-	7.54
HLA-DRB1*07:01	RIKILCATYVKVNIRD	16	Consensus	9.7	-	12.21
HLA-DRB1*12:01	RIKILCATYVKVNIRD	16	Consensus	6.75	-	1.97
HLA-DRB1*15:01	RIKILCATYVKVNIRD	16	Consensus	7.96	-	11.16
HLA-DRB3*02:02	RIKILCATYVKVNIRD	16	NetMHCIIpan	17.31	962.33	16.40
HLA-DPA1*01:03/DPB1*04:01	RIKILCATYVKVNIRD	17	NetMHCIIpan	11.24	240.54	17.41
HLA-DPA1*02:01/DPB1*14:01	RIKILCATYVKVNIRD	17	NetMHCIIpan	18.74	986.48	11.59
HLA-DRB1*01:01	RIKILCATYVKVNIRD	17	Consensus	7.15	-	7.54
HLA-DRB1*07:01	RIKILCATYVKVNIRD	17	Consensus	6.98	-	12.21
HLA-DRB1*12:01	RIKILCATYVKVNIRD	17	Consensus	1.53	-	1.68
HLA-DRB1*15:01	RIKILCATYVKVNIRD	17	Consensus	7.83	-	4.60
HLA-DPA1*01:03/DPB1*04:01	RIKILCATYVKVNIRDID	18	NetMHCIIpan	25.16	268.14	17.41
HLA-DRB1*01:01	RIKILCATYVKVNIRDID	18	Consensus	3.26	-	1.68
HLA-DRB1*07:01	RIKILCATYVKVNIRDID	18	Consensus	2.03	-	7.54
HLA-DRB1*12:01	RIKILCATYVKVNIRDID	18	Consensus	4.05	-	0.68
HLA-DRB1*15:01	RIKILCATYVKVNIRDID	18	Consensus	8.73	-	4.60
HLA-DPA1*01:03/DPB1*04:01	SALRIKILCATYVKVNIRDID	18	NetMHCIIpan	14	978.7	17.41
HLA-DRB1*01:01	SALRIKILCATYVKVNIRDID	18	Consensus	1.94	-	7.54
HLA-DRB1*07:01	SALRIKILCATYVKVNIRDID	18	Consensus	8.08	-	1.16
HLA-DRB1*08:02	SALRIKILCATYVKVNIRDID	18	Consensus	5.06	-	12.21
HLA-DRB1*13:02	SALRIKILCATYVKVNIRDID	18	Consensus	3.88	-	0.68
HLA-DPA1*01:03/DPB1*04:01	SALRIKILCATYVKVNIRDID	18	NetMHCIIpan	1.56	-	1.97
HLA-DRB1*13:02	SALRIKILCATYVKVNIRDID	18	Consensus	7.65	-	4.60
HLA-DRB1*15:01	SALRIKILCATYVKVNIRDID	18	Consensus	2.48	-	11.16
HLA-DRB3*02:02	SALRIKILCATYVKVNIRDID	18	NetMHCIIpan	11.84	877.8	16.40
HLA-DRB4*01:01	SALRIKILCATYVKVNIRDID	18	Consensus	5.71	-	28.00
HLA-DRB5*01:01	SALRIKILCATYVKVNIRDID	18	Consensus	6.46	-	16.10
HLA-DPA1*01:03/DPB1*02:01	SALRIKILCATYVKV	15	Consensus	8.6	-	15.31
HLA-DPA1*01:03/DPB1*04:01	SALRIKILCATYVKV	15	NetMHCIIpan	4.5	228.7	17.41
HLA-DPA1*02:01/DPB1*14:01	SALRIKILCATYVKV	15	NetMHCIIpan	4.4	932.51	11.59
HLA-DRB1*01:01	SALRIKILCATYVKV	15	Consensus	2	-	7.54
HLA-DRB1*04:05	SALRIKILCATYVKV	15	Consensus	8.9	-	1.16

HLA-DRB1*07:01	SALRIKILCATYVKV	15	Consensus	4.9	-	12.21
HLA-DRB1*08:02	SALRIKILCATYVKV	15	Consensus	4.4	-	0.68
HLA-DRB1*12:01	SALRIKILCATYVKV	15	Consensus	1.8	-	1.97
HLA-DRB1*13:02	SALRIKILCATYVKV	15	Consensus	5.7	-	4.60
HLA-DRB1*15:01	SALRIKILCATYVKV	15	Consensus	2.6	-	11.16
HLA-DRB3*02:02	SALRIKILCATYVKV	15	NetMHCIIpan	11	639.82	16.40
HLA-DRB4*01:01	SALRIKILCATYVKV	15	Consensus	6.2	-	28.00
HLA-DRB5*01:01	SALRIKILCATYVKV	15	Consensus	7.1	-	16.10
HLA-DPA1*01:03/DPB1*04:01	SALRIKILCATYVKVN	16	NetMHCIIpan	6.46	226.93	17.41
HLA-DPA1*02:01/DPB1*14:01	SALRIKILCATYVKVN	16	NetMHCIIpan	6.58	792.9	11.59
HLA-DRB1*01:01	SALRIKILCATYVKVN	16	Consensus	3.35	-	7.54
HLA-DRB1*07:01	SALRIKILCATYVKVN	16	Consensus	7.73	-	12.21
HLA-DRB1*08:02	SALRIKILCATYVKVN	16	Consensus	7.62	-	0.68
HLA-DRB1*12:01	SALRIKILCATYVKVN	16	Consensus	2.89	-	1.97
HLA-DRB1*13:02	SALRIKILCATYVKVN	16	Consensus	7.5	-	4.60
HLA-DRB1*15:01	SALRIKILCATYVKVN	16	Consensus	4.5	-	11.16
HLA-DRB3*02:02	SALRIKILCATYVKVN	16	NetMHCIIpan	15.01	785.89	16.40
HLA-DRB4*01:01	SALRIKILCATYVKVN	16	Consensus	7.5	-	28.00
HLA-DPA1*01:03/DPB1*04:01	SALRIKILCATYVKVNI	17	NetMHCIIpan	9.37	210.78	17.41
HLA-DPA1*02:01/DPB1*14:01	SALRIKILCATYVKVNI	17	NetMHCIIpan	12.26	763.95	11.59
HLA-DRB1*01:01	SALRIKILCATYVKVNI	17	Consensus	5.79	-	7.54
HLA-DRB1*12:01	SALRIKILCATYVKVNI	17	Consensus	5.11	-	1.97
HLA-DRB1*15:01	SALRIKILCATYVKVNI	17	Consensus	8.86	-	11.16
HLA-DRB3*02:02	SALRIKILCATYVKVNI	17	NetMHCIIpan	23.85	935.3	16.40
HLA-DPA1*01:03/DPB1*04:01	SALRIKILCATYVKVNIR	18	NetMHCIIpan	19.24	223.06	17.41
HLA-DPA1*02:01/DPB1*14:01	SALRIKILCATYVKVNIR	18	NetMHCIIpan	23.09	711.22	11.59
HLA-DRB3*02:02	SALRIKILCATYVKVNIR	18	NetMHCIIpan	44.4	978.08	16.40
HLA-DRB1*01:01	SLWVINSALRIK	12	Consensus	8.9	-	7.54
HLA-DRB1*08:02	SLWVINSALRIK	12	Consensus	7.12	-	0.68
HLA-DRB1*15:01	SLWVINSALRIK	12	Consensus	8.9	-	11.16
HLA-DRB1*11:01	SLWVINSALRIKI	13	Consensus	4.52	-	4.25
HLA-DRB1*03:01	SLWVINSALRIKIL	14	Consensus	9.15	-	9.82
HLA-DRB1*11:01	SLWVINSALRIKIL	14	Consensus	3.66	-	4.25
HLA-DRB1*08:02	SLWVINSALRIKILC	15	Consensus	4.2	-	0.68
HLA-DRB1*11:01	SLWVINSALRIKILC	15	Consensus	4.3	-	4.25
HLA-DRB1*15:01	SLWVINSALRIKILC	15	Consensus	5.8	-	11.16
HLA-DRB1*08:02	SLWVINSALRIKILCA	16	Consensus	3.58	-	0.68
HLA-DRB1*11:01	SLWVINSALRIKILCA	16	Consensus	6.93	-	4.25
HLA-DRB1*15:01	SLWVINSALRIKILCA	16	Consensus	4.85	-	11.16
HLA-DRB1*08:02	SLWVINSALRIKILCAT	17	Consensus	2.9	-	0.68
HLA-DRB1*15:01	SLWVINSALRIKILCAT	17	Consensus	8.18	-	11.16
HLA-DRB3*01:01	SLWVINSALRIKILCAT	17	Consensus	5.28	-	18.00
HLA-DRB1*08:02	SLWVINSALRIKILCATY	18	Consensus	5.33	-	0.68
HLA-DRB3*01:01	SLWVINSALRIKILCATY	18	Consensus	9.77	-	18.00
HLA-DRB1*04:01	STATPYMNGETSTKS	15	Consensus	4.7	-	6.37
HLA-DRB1*04:01	STATPYMNGETSTKSL	16	Consensus	6.35	-	6.37
HLA-DRB1*01:01	STKSLWVINSALRI	14	Consensus	4.52	-	7.54
HLA-DRB1*03:01	STKSLWVINSALRI	14	Consensus	9.15	-	9.82
HLA-DRB1*11:01	STKSLWVINSALRI	16	Consensus	7.5	-	4.25
HLA-DRB1*08:02	STKSLWVINSALRIKIL	17	Consensus	5.96	-	0.68
HLA-DRB1*15:01	STKSLWVINSALRIKIL	17	Consensus	7.83	-	11.16
HLA-DRB3*01:01	STKSLWVINSALRIKILC	18	Consensus	9.47	-	18.00
HLA-DRB1*04:01	TATPYMNGETSTKS	14	Consensus	4.52	-	6.37
HLA-DRB1*04:01	TATPYMNGETSTKSL	15	Consensus	4.7	-	6.37
HLA-DRB1*01:01	TATPYMNGETSTKSLW	16	Consensus	6.35	-	6.37
HLA-DRB1*03:01	TKSLWVINSALRI	13	Consensus	5.61	-	7.54
HLA-DRB1*11:01	TKSLWVINSALRIK	14	Consensus	9.15	-	9.82
HLA-DRB1*11:01	TKSLWVINSALRIKI	15	Consensus	4.5	-	4.25
HLA-DRB1*08:02	TKSLWVINSALRIKIL	16	Consensus	6.93	-	4.25
HLA-DRB1*15:01	TKSLWVINSALRIKIL	17	Consensus	5.96	-	0.68
HLA-DRB3*01:01	TKSLWVINSALRIKILCA	18	Consensus	7.83	-	11.16
HLA-DRB1*04:01	TATPYMNGETSTKS	14	Consensus	9.47	-	18.00
HLA-DRB1*04:01	TATPYMNGETSTKSL	15	Consensus	4.7	-	6.37
HLA-DRB1*01:01	TATPYMNGETSTKSLW	16	Consensus	6.35	-	6.37
HLA-DRB1*03:01	TKSLWVINSALRI	13	Consensus	5.61	-	7.54
HLA-DRB1*11:01	TKSLWVINSALRIK	14	Consensus	9.15	-	9.82
HLA-DRB1*11:01	TKSLWVINSALRIKI	15	Consensus	4.5	-	4.25
HLA-DRB1*08:02	TKSLWVINSALRIKIL	16	Consensus	6.93	-	4.25
HLA-DRB1*15:01	TKSLWVINSALRIKIL	17	Consensus	5.96	-	0.68
HLA-DRB3*01:01	TKSLWVINSALRIKILCA	18	Consensus	7.83	-	11.16
HLA-DRB1*04:01	TATPYMNGETSTKS	14	Consensus	9.47	-	18.00
HLA-DRB1*04:01	TATPYMNGETSTKSL	15	Consensus	4.7	-	6.37
HLA-DRB1*01:01	TATPYMNGETSTKSLW	16	Consensus	6.35	-	6.37
HLA-DRB1*03:01	TKSLWVINSALRI	13	Consensus	5.61	-	7.54
HLA-DRB1*11:01	TKSLWVINSALRIK	14	Consensus	9.15	-	9.82
HLA-DRB1*11:01	TKSLWVINSALRIKI	15	Consensus	4.5	-	4.25
HLA-DRB1*08:02	TKSLWVINSALRIKIL	16	Consensus	6.93	-	4.25
HLA-DRB1*15:01	TKSLWVINSALRIKIL	17	Consensus	5.96	-	0.68
HLA-DRB1*08:02	TKSLWVINSALRIKILCA	18	Consensus	7.83	-	11.16
HLA-DRB3*01:01	TKSLWVINSALRIKILCA	18	Consensus	9.47	-	18.00
HLA-DRB1*08:02	TMPYSRISTATP	14	Consensus	8.94	-	0.68
HLA-DRB1*04:01	TPYMNGETSTKS	12	Consensus	8.9	-	6.37
HLA-DRB1*04:01	TPYMNGETSTKSL	13	Consensus	5.61	-	6.37
HLA-DRB1*04:01	TPYMNGETSTKSLW	14	Consensus	4.52	-	6.37
HLA-DRB1*04:01	TPYMNGETSTKSLWV	15	Consensus	4.7	-	6.37
HLA-DRB1*04:01	TPYMNGETSTKSLWVI	16	Consensus	6.35	-	6.37
HLA-DRB1*01:01	TSTKSLWVINSALRI	15	Consensus	4.8	-	7.54
HLA-DRB1*08:02	TSTKSLWVINSALRI	15	Consensus	2.7	-	0.68
HLA-DRB1*08:02	TSTKSLWVINSALRIK	16	Consensus	3.58	-	0.68
HLA-DRB1*15:01	TSTKSLWVINSALRIK	16	Consensus	5.19	-	11.16
HLA-DRB1*08:02	TSTKSLWVINSALRIKI	17	Consensus	5.96	-	0.68
HLA-DRB1*15:01	TSTKSLWVINSALRIKI	17	Consensus	8.18	-	11.16
HLA-DRB1*08:02	TSTKSLWVINSALRIKIL	17	Consensus	9.47	-	18.00
HLA-DRB1*01:01	TSTKSLWVINSALRIKIL	18	Consensus	3.69	-	7.54
HLA-DRB1*08:02	VINSALRIKILCATYV	16	Consensus	6.46	-	0.68
HLA-DPA1*01:03/DPB1*04:01	VINSALRIKILCATYV	17	NetMHCIIpan	35.77	669.67	17.41
HLA-DQA1*01:02/DPB1*06:02	VINSALRIKILCATYVK	17	Consensus	4.26	-	10.40
HLA-DRB1*01:01	VINSALRIKILCATYVK	17	Consensus	6.13	-	7.54
HLA-DRB1*12:01	VINSALRIKILCATYVK	17	Consensus	4.09	-	1.97
HLA-DPA1*01:03/DPB1*04:01	VINSALRIKILCATYVKV	18	NetMHCIIpan	23.09	250.89	17.41
HLA-DPA1*02:01/DPB1*14:01	VINSALRIKILCATYVKV	18	NetMHCIIpan	24.86	756.7	11.59
HLA-DQA1*01:02/DPB1*06:02	VINSALRIKILCATYVKV	18	Consensus	9.77	-	10.40
HLA-DRB1*12:01	VINSALRIKILCATYVKV	18	Consensus	7.55	-	1.97
HLA-DRB1*03:01	VKVNIRDIDKIYVR	14	Consensus	8.18	-	9.82
HLA-DRB1*03:01	VKVNIRDIDKIYVR	15	Consensus	9.3	-	9.82
HLA-DRB1*11:01	VNIRDIDKIYVRTG	14	Consensus	8.08	-	4.25
HLA-DRB1*11:01	VNIRDIDKIYVRTGI	15	Consensus	8.7	-	4.25
HLA-DRB1*11:01	WVINSALRIKIL	12	Consensus	6.82	-	4.25
HLA-DRB3*01:01	WVINSALRIKIL	12	Consensus	9.19	-	18.00
HLA-DRB1*11:01	WVINSALRIKIL	13	Consensus	5.46	-	4.25
HLA-DRB3*01:01	WVINSALRIKIL	13	Consensus	6.39	-	18.00

	HLA-DRB1*01:01	WVINSALRIKILCA	14	Consensus	9.91	-	7.54
	HLA-DRB1*03:01	WVINSALRIKILCA	14	Consensus	9.15	-	9.82
	HLA-DRB1*11:01	WVINSALRIKILCA	14	Consensus	4.52	-	4.25
	HLA-DRB3*01:01	WVINSALRIKILCA	14	Consensus	5.81	-	18.00
	HLA-DRB1*11:01	WVINSALRIKILCAT	15	Consensus	5.2	-	4.25
	HLA-DRB3*01:01	WVINSALRIKILCAT	15	Consensus	6.8	-	18.00
	HLA-DRB1*11:01	WVINSALRIKILCATY	16	Consensus	7.5	-	4.25
	HLA-DRB3*01:01	WVINSALRIKILCATY	16	Consensus	3.35	-	18.00
	HLA-DRB1*01:01	WVINSALRIKILCATYV	17	Consensus	3.41	-	7.54
	HLA-DRB1*11:01	WVINSALRIKILCATYV	17	Consensus	6.13	-	4.25
	HLA-DRB1*15:01	WVINSALRIKILCATYV	17	Consensus	5.11	-	11.16
	HLA-DRB3*01:01	WVINSALRIKILCATYV	17	Consensus	5.62	-	18.00
	HLA-DPA1*01:03/DPB1*04:01	WVINSALRIKILCATVK	18	NetMHCIIpan	41.44	397.76	17.41
	HLA-DPA1*02:01/DPB1*14:01	WVINSALRIKILCATVK	18	NetMHCIIpan	26.05	781.41	11.59
	HLA-DQA1*01:02/DOB1*06:02	WVINSALRIKILCATVK	18	Consensus	7.7	-	10.40
	HLA-DRB1*01:01	WVINSALRIKILCATVK	18	Consensus	6.22	-	7.54
	HLA-DRB1*12:01	WVINSALRIKILCATVK	18	Consensus	3.66	-	1.97
	HLA-DRB1*13:02	WVINSALRIKILCATVK	18	Consensus	2.46	-	4.60
	HLA-DRB1*15:01	WVINSALRIKILCATVK	18	Consensus	9.77	-	11.16
	HLA-DRB3*02:02	WVINSALRIKILCATVK	18	NetMHCIIpan	6.51	146.81	16.40
	HLA-DRB1*04:01	YMMGETSTKSLWVINS	16	Consensus	6.35	-	6.37
	HLA-DRB1*03:01	YVKVNIRDIDKIYVR	15	Consensus	9.4	-	9.82
TP53 R196*					-	-	-
TP53 R175H	HLA-DQA1*01:02/DQB1*06:02	KQSQHMTEVVRHCP	14	Consensus	8.2	-	10.40
	HLA-DQA1*01:02/DOB1*06:02	KQSQHMTEVVRHCPH	15	Consensus	8	-	10.40
	HLA-DQA1*01:02/DOB1*06:02	QSQHMTEVVRHCPH	14	Consensus	7.4	-	10.40
TP53 Y220C	HLA-DRB1*04:05	DDRNTFRHSVVVPC	14	Consensus	6.57	-	1.16
	HLA-DRB1*07:01	DDRNTFRHSVVVPC	14	Consensus	4.74	-	12.21
	HLA-DRB3*02:02	DDRNTFRHSVVVPC	14	NetMHCIIpan	7.32	549.98	16.40
	HLA-DRB1*04:05	DDRNTFRHSVVVPC	15	Consensus	7.5	-	1.16
	HLA-DRB1*07:01	DDRNTFRHSVVVPC	15	Consensus	5	-	12.21
	HLA-DRB3*02:02	DDRNTFRHSVVVPC	15	NetMHCIIpan	5.7	342.08	16.40
	HLA-DRB1*07:01	DDRNTFRHSVVVPC	16	Consensus	6.46	-	12.21
	HLA-DRB3*02:02	DDRNTFRHSVVVPC	16	NetMHCIIpan	8.31	434.46	16.40
	HLA-DRB3*02:02	DDRNTFRHSVVVPC	17	NetMHCIIpan	15.67	598.28	16.40
	HLA-DRB3*02:02	DDRNTFRHSVVVPC	18	NetMHCIIpan	32.56	677.58	16.40
	HLA-DRB1*04:05	DRNTFRHSVVVPC	13	Consensus	7.17	-	1.16
	HLA-DRB1*07:01	DRNTFRHSVVVPC	13	Consensus	5.77	-	12.21
	HLA-DRB3*02:02	DRNTFRHSVVVPC	13	NetMHCIIpan	7.02	601.87	16.40
	HLA-DRB1*04:05	DRNTFRHSVVVPC	14	Consensus	6.35	-	1.16
	HLA-DRB1*07:01	DRNTFRHSVVVPC	14	Consensus	4.74	-	12.21
	HLA-DRB3*02:02	DRNTFRHSVVVPC	14	NetMHCIIpan	4.52	330.49	16.40
	HLA-DRB1*04:05	DRNTFRHSVVVPC	15	Consensus	8	-	1.16
	HLA-DRB1*07:01	DRNTFRHSVVVPC	15	Consensus	5	-	12.21
	HLA-DRB3*02:02	DRNTFRHSVVVPC	15	NetMHCIIpan	5.4	319.65	16.40
	HLA-DRB1*07:01	DRNTFRHSVVVPC	16	Consensus	6.46	-	12.21
	HLA-DRB3*02:02	DRNTFRHSVVVPC	16	NetMHCIIpan	8.43	438.47	16.40
	HLA-DRB3*02:02	DRNTFRHSVVVPC	17	NetMHCIIpan	15.5	591.96	16.40
	HLA-DRB3*02:02	DRNTFRHSVVVPC	18	NetMHCIIpan	32.56	676.55	16.40
	HLA-DRB3*02:02	EYLDDRNTRHSVVVPC	17	NetMHCIIpan	22.14	811.08	16.40
	HLA-DRB3*02:02	EYLDDRNTRHSVVVPC	18	NetMHCIIpan	32.56	659.15	16.40
	HLA-DRB1*04:05	LDDRNTRHSVVVPC	15	Consensus	7.8	-	1.16
	HLA-DRB1*07:01	LDDRNTRHSVVVPC	15	Consensus	5	-	12.21
	HLA-DRB3*02:02	LDDRNTRHSVVVPC	15	NetMHCIIpan	9.1	563.59	16.40
	HLA-DRB1*07:01	LDDRNTRHSVVVPC	16	Consensus	6.46	-	12.21
	HLA-DRB3*02:02	LDDRNTRHSVVVPC	16	NetMHCIIpan	8.89	466.71	16.40
	HLA-DRB3*02:02	LDDRNTRHSVVVPC	17	NetMHCIIpan	15.67	600.51	16.40
	HLA-DRB3*02:02	LDDRNTRHSVVVPC	18	NetMHCIIpan	32.56	695.28	16.40
	HLA-DRB1*04:05	NTRFRHSVVVPC	12	Consensus	9.79	-	1.16
	HLA-DRB1*07:01	NTRFRHSVVVPC	12	Consensus	9.19	-	12.21
	HLA-DRB3*02:02	NTRFRHSVVVPC	12	NetMHCIIpan	7.12	708.16	16.40
	HLA-DQA1*01:02/DOB1*06:02	NTRFRHSVVVPC	13	Consensus	9.67	-	10.40
	HLA-DRB1*04:05	NTRFRHSVVVPC	13	Consensus	7.64	-	1.16
	HLA-DRB1*07:01	NTRFRHSVVVPC	13	Consensus	5.77	-	12.21
	HLA-DRB3*02:02	NTRFRHSVVVPC	13	NetMHCIIpan	7.02	600.26	16.40
	HLA-DRB1*04:05	NTRFRHSVVVPC	14	Consensus	7.32	-	1.16
	HLA-DRB1*07:01	NTRFRHSVVVPC	14	Consensus	4.74	-	12.21
	HLA-DRB3*02:02	NTRFRHSVVVPC	14	NetMHCIIpan	7.43	556.15	16.40
	HLA-DRB1*04:05	NTRFRHSVVVPC	15	Consensus	8.5	-	1.16
	HLA-DRB1*07:01	NTRFRHSVVVPC	15	Consensus	5	-	12.21
	HLA-DRB3*02:02	NTRFRHSVVVPC	15	NetMHCIIpan	9.3	575.94	16.40
	HLA-DRB1*07:01	NTRFRHSVVVPC	16	Consensus	6.46	-	12.21
	HLA-DRB3*02:02	NTRFRHSVVVPC	16	NetMHCIIpan	15.01	770.18	16.40
	HLA-DRB1*04:05	RNTFRHSVVVPC	12	Consensus	9.79	-	1.16
	HLA-DRB1*07:01	RNTFRHSVVVPC	12	Consensus	9.19	-	12.21
	HLA-DRB3*02:02	RNTFRHSVVVPC	12	NetMHCIIpan	7.64	-	1.16
	HLA-DRB1*04:05	RNTFRHSVVVPC	13	Consensus	5.77	-	12.21
	HLA-DRB1*07:01	RNTFRHSVVVPC	13	NetMHCIIpan	7.02	600.26	16.40
	HLA-DRB3*02:02	RNTFRHSVVVPC	14	Consensus	7.32	-	1.16
	HLA-DRB1*07:01	RNTFRHSVVVPC	14	Consensus	4.74	-	12.21
	HLA-DRB3*02:02	RNTFRHSVVVPC	14	NetMHCIIpan	7.43	556.15	16.40
	HLA-DRB1*04:05	RNTFRHSVVVPC	15	Consensus	8.5	-	1.16
	HLA-DRB1*07:01	RNTFRHSVVVPC	15	Consensus	5	-	12.21
	HLA-DRB3*02:02	RNTFRHSVVVPC	15	NetMHCIIpan	9.3	575.94	16.40
	HLA-DRB1*07:01	RNTFRHSVVVPC	16	Consensus	6.46	-	12.21
	HLA-DRB3*02:02	RNTFRHSVVVPC	16	NetMHCIIpan	15.01	770.18	16.40
	HLA-DQA1*01:02/DOB1*06:02	RNTFRHSVVVPC	14	Consensus	9.05	-	10.40
	HLA-DRB1*04:05	RNTFRHSVVVPC	14	Consensus	6.78	-	1.16
	HLA-DRB1*07:01	RNTFRHSVVVPC	14	Consensus	4.74	-	12.21
	HLA-DRB3*02:02	RNTFRHSVVVPC	14	NetMHCIIpan	3.98	294.56	16.40
	HLA-DRB1*04:05	RNTFRHSVVVPC	15	Consensus	8.4	-	1.16
	HLA-DRB1*07:01	RNTFRHSVVVPC	15	Consensus	5	-	12.21
	HLA-DRB3*02:02	RNTFRHSVVVPC	15	NetMHCIIpan	5.2	310.03	16.40
	HLA-DRB1*07:01	RNTFRHSVVVPC	16	Consensus	6.46	-	12.21
	HLA-DRB3*02:02	RNTFRHSVVVPC	16	NetMHCIIpan	8.2	423.37	16.40
	HLA-DRB3*02:02	RNTFRHSVVVPC	17	NetMHCIIpan	15.16	574.94	16.40
	HLA-DRB3*02:02	RNTFRHSVVVPC	18	NetMHCIIpan	32.56	674.71	16.40
	HLA-DRB1*07:01	TFRHSVVVPC	12	Consensus	9.19	-	12.21
	HLA-DRB1*07:01	TFRHSVVVPC	13	Consensus	5.77	-	12.21
	HLA-DRB1*07:01	TFRHSVVVPC	14	Consensus	4.85	-	12.21

HLA-DRB1*07:01	TFRHSVVVPCEPPEV	15	Consensus	5.1	-	12.21
HLA-DRB1*07:01	TFRHSVVVPCEPPEVG	16	Consensus	6.46	-	12.21
HLA-DRB3*02:02	VEYLDDRNTFRHSVVVPC	18	NetMHCIIpan	38.48	849.22	16.40
HLA-DRB1*04:01	YLDDRNTFRHSVVVPC	16	Consensus	9	-	6.37
HLA-DRB1*07:01	YLDDRNTFRHSVVVPC	16	Consensus	6.46	-	12.21
HLA-DRB3*02:02	YLDDRNTFRHSVVVPC	16	NetMHCIIpan	12.7	679.25	16.40
HLA-DRB3*02:02	YLDDRNTFRHSVVVPCE	17	NetMHCIIpan	15.84	607.86	16.40
HLA-DRB3*02:02	YLDDRNTFRHSVVVCEP	18	NetMHCIIpan	32.56	661.72	16.40