

# HaploPrep™ Probe Book for HLA-Cw



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**Intended Use:**

HaploPrep™ is intended for the separation of alleles into their haploid components for downstream analysis. This collection of probes for HLA-Cw is designed to separate allele combinations that cause ambiguities, or for the characterization of new alleles.

**Background:**

HaploPrep™ or Haplotype-Specific Extraction (HSE) physically separates diploid genomic DNA into its haploid components. These components can then be separately analyzed by routine DNA typing methods that are currently used on standard diploid DNA. By separating the alleles, HaploPrep™ provides the advantage to individually analyze each gene.

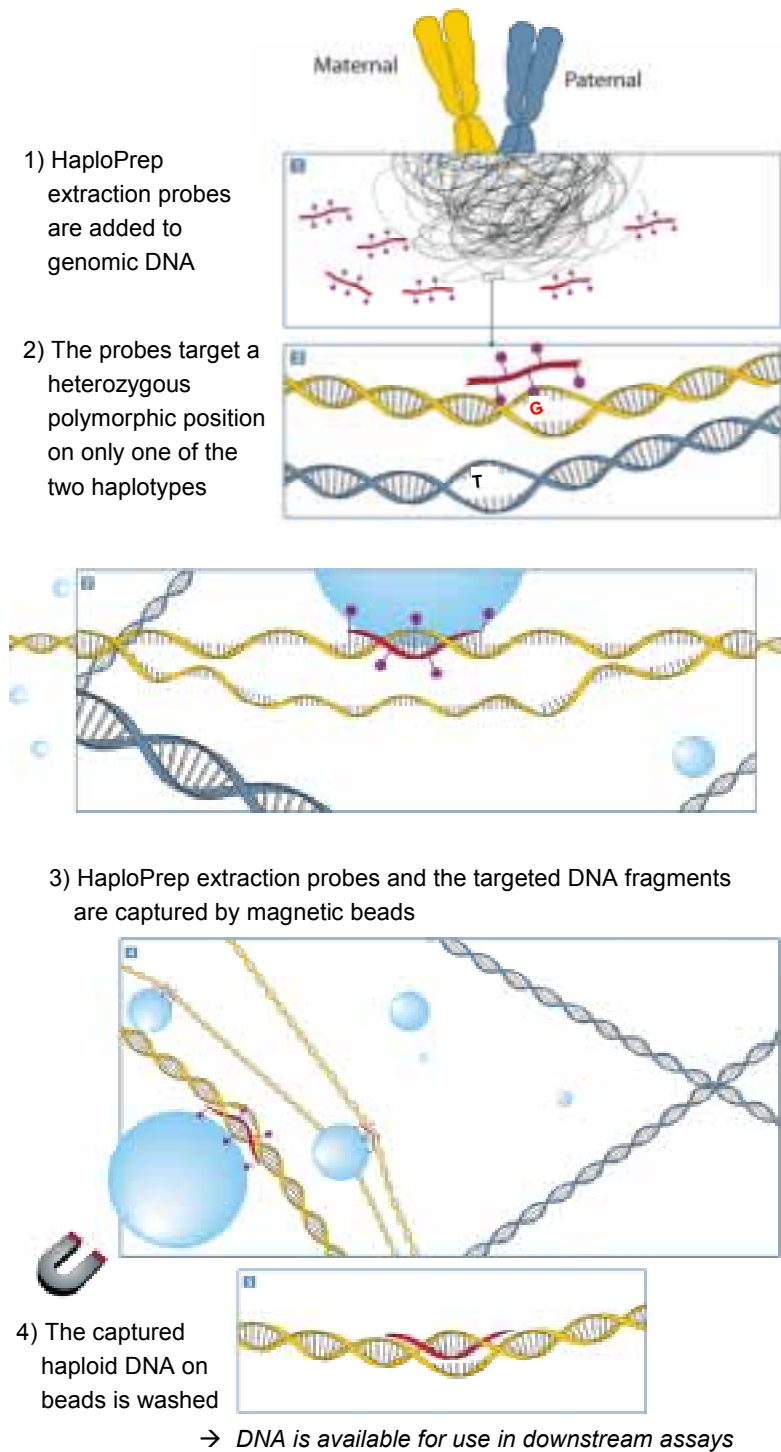
HSE has been tested with direct sequencing; forward sequence-specific oligonucleotide probes (SSO), reverse SSO, sequence-specific priming (SSP), homogeneous luminescent genotyping, and restriction fragment length polymorphism (RFLP) digests.

HSE technology for HLA is developed under a collaboration of GenoVision and Generation Biotech.

Patents pending US 09/735,099 and international applications.

**Principle:**

HSE separates DNA into its haploid components by exploiting the heterozygous differences between allele combinations. DNA is hybridized with specially designed probes, then magnetic beads capture the hybridized DNA fragments and the haploid component is purified, leaving the non-targeted allele in the solution.



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**Probe Targets – Unique Sequence Elements**

HLA-Cw Probe #	Unique Sequence Element	Center Position	Exon
Cw97G	TC <u>G</u> AC	97	2
Cw102C	AC <u>C</u> GC	102	2
Cw103T	CA <u>T</u> CC	103	2
Cw142G	TC <u>G</u> CA	142	2
Cw176G	GC <u>G</u> GT	176	2
Cw302A	GA <u>A</u> CC	302	2
Cw312C	AA <u>C</u> CT	312	2
Cw355A	TC <u>A</u> TC	355	3
Cw419C	GT <u>C</u> CG	419	3
Cw419T	GT <u>T</u> CG	419	3
Cw486C	AC <u>C</u> GC	486	3
Cw486G	AC <u>G</u> GC	486	3
Cw539G	GC <u>G</u> GA	539	3
Cw559C	GC <u>C</u> TG	559	3
Cw559G	GC <u>G</u> AG	559	3

## How to Select Probes for Haplotype-Specific Extraction:

Selection of the appropriate probes is an important but complex process due to the highly polymorphic nature of HLA genes; therefore, the data and specificity of each probe is presented in several formats:

- The **Allele Level Chart** lists all alleles and their reactivity with the probes.
- The **Serology Group Chart** lists alleles in their serology groups. The probe which most effectively extracts the group is listed first. Exceptions are listed specifically indicating alleles within a group which are not captured, alleles that are weakly targeted, and alleles for which the sequence information is unknown.
- The **HLA-Cw Probe Matrix Chart** lists the suggested probes to use with specified serology group combinations. The probes listed will capture most of the alleles within the serology group, except those probes that are listed in **bold**. These probes capture the most frequent alleles within the serology group but may capture both alleles.
- The **Cw Common Ambiguity Chart** list common ambiguities with the probes chosen for the user.
- The **Probe Chart** lists the alleles targeted by the individual probes.

The low-resolution type must be known for a sample before using HSE. The principle of the extraction is to target a known heterozygous position. A sample that is a known homozygote cannot be separated.

The following examples of how to select HLA-B probes can be extrapolated to help select probes for any HLA loci:

- Refer to the **allele level chart** and find the allele you wish to target in the first column of the chart. Probes are listed on top of the chart in the first row. Probes which target an allele are designated by black cells. Grey cells indicate that the probe targets the allele weakly. If the intersecting cell is white, the probe does not target the allele.

- For example, if you wish to separate a sample with a low-resolution type of HLA-B\*08xx and HLA-B\*42xx, the allele level chart lists several probes which target most \*08 alleles: B261C, B277A, B317T, B355C, and B539A. Closer inspection will show that the last 3 probes do not target several of the

Allele	B*0101	B*0102	B*0103	B*0104	B*0105	B*0106	B*0107	B*0108	B*0109	B*0110	B*0111	B*0112	B*0113	B*0114	B*0115	B*0116	B*0117	B*0118	B*0119	B*0120	B*0121	B*0122	B*0123	B*0124	B*0125	B*0126	B*0127	B*0128	B*0129	B*0130	B*0131	B*0132	B*0133	B*0134	B*0135	B*0136	B*0137	B*0138	B*0139	B*0140	B*0141	B*0142	B*0143	B*0144	B*0145	B*0146	B*0147	B*0148	B*0149	B*0150	B*0151	B*0152	B*0153	B*0154	B*0155	B*0156	B*0157	B*0158	B*0159	B*0160	B*0161	B*0162	B*0163	B*0164	B*0165	B*0166	B*0167	B*0168	B*0169	B*0170	B*0171	B*0172	B*0173	B*0174	B*0175	B*0176	B*0177	B*0178	B*0179	B*0180	B*0181	B*0182	B*0183	B*0184	B*0185	B*0186	B*0187	B*0188	B*0189	B*0190	B*0191	B*0192	B*0193	B*0194	B*0195	B*0196	B*0197	B*0198	B*0199	B*0200	B*0201	B*0202	B*0203	B*0204	B*0205	B*0206	B*0207	B*0208	B*0209	B*0210	B*0211	B*0212	B*0213	B*0214	B*0215	B*0216	B*0217	B*0218	B*0219	B*0220	B*0221	B*0222	B*0223	B*0224	B*0225	B*0226	B*0227	B*0228	B*0229	B*0230	B*0231	B*0232	B*0233	B*0234	B*0235	B*0236	B*0237	B*0238	B*0239	B*0240	B*0241	B*0242	B*0243	B*0244	B*0245	B*0246	B*0247	B*0248	B*0249	B*0250	B*0251	B*0252	B*0253	B*0254	B*0255	B*0256	B*0257	B*0258	B*0259	B*0260	B*0261	B*0262	B*0263	B*0264	B*0265	B*0266	B*0267	B*0268	B*0269	B*0270	B*0271	B*0272	B*0273	B*0274	B*0275	B*0276	B*0277	B*0278	B*0279	B*0280	B*0281	B*0282	B*0283	B*0284	B*0285	B*0286	B*0287	B*0288	B*0289	B*0290	B*0291	B*0292	B*0293	B*0294	B*0295	B*0296	B*0297	B*0298	B*0299	B*0300	B*0301	B*0302	B*0303	B*0304	B*0305	B*0306	B*0307	B*0308	B*0309	B*0310	B*0311	B*0312	B*0313	B*0314	B*0315	B*0316	B*0317	B*0318	B*0319	B*0320	B*0321	B*0322	B*0323	B*0324	B*0325	B*0326	B*0327	B*0328	B*0329	B*0330	B*0331	B*0332	B*0333	B*0334	B*0335	B*0336	B*0337	B*0338	B*0339	B*0340	B*0341	B*0342	B*0343	B*0344	B*0345	B*0346	B*0347	B*0348	B*0349	B*0350	B*0351	B*0352	B*0353	B*0354	B*0355	B*0356	B*0357	B*0358	B*0359	B*0360	B*0361	B*0362	B*0363	B*0364	B*0365	B*0366	B*0367	B*0368	B*0369	B*0370	B*0371	B*0372	B*0373	B*0374	B*0375	B*0376	B*0377	B*0378	B*0379	B*0380	B*0381	B*0382	B*0383	B*0384	B*0385	B*0386	B*0387	B*0388	B*0389	B*0390	B*0391	B*0392	B*0393	B*0394	B*0395	B*0396	B*0397	B*0398	B*0399	B*0400	B*0401	B*0402	B*0403	B*0404	B*0405	B*0406	B*0407	B*0408	B*0409	B*0410	B*0411	B*0412	B*0413	B*0414	B*0415	B*0416	B*0417	B*0418	B*0419	B*0420	B*0421	B*0422	B*0423	B*0424	B*0425	B*0426	B*0427	B*0428	B*0429	B*0430	B*0431	B*0432	B*0433	B*0434	B*0435	B*0436	B*0437	B*0438	B*0439	B*0440	B*0441	B*0442	B*0443	B*0444	B*0445	B*0446	B*0447	B*0448	B*0449	B*0450	B*0451	B*0452	B*0453	B*0454	B*0455	B*0456	B*0457	B*0458	B*0459	B*0460	B*0461	B*0462	B*0463	B*0464	B*0465	B*0466	B*0467	B*0468	B*0469	B*0470	B*0471	B*0472	B*0473	B*0474	B*0475	B*0476	B*0477	B*0478	B*0479	B*0480	B*0481	B*0482	B*0483	B*0484	B*0485	B*0486	B*0487	B*0488	B*0489	B*0490	B*0491	B*0492	B*0493	B*0494	B*0495	B*0496	B*0497	B*0498	B*0499	B*0500	B*0501	B*0502	B*0503	B*0504	B*0505	B*0506	B*0507	B*0508	B*0509	B*0510	B*0511	B*0512	B*0513	B*0514	B*0515	B*0516	B*0517	B*0518	B*0519	B*0520	B*0521	B*0522	B*0523	B*0524	B*0525	B*0526	B*0527	B*0528	B*0529	B*0530	B*0531	B*0532	B*0533	B*0534	B*0535	B*0536	B*0537	B*0538	B*0539	B*0540	B*0541	B*0542	B*0543	B*0544	B*0545	B*0546	B*0547	B*0548	B*0549	B*0550	B*0551	B*0552	B*0553	B*0554	B*0555	B*0556	B*0557	B*0558	B*0559	B*0560	B*0561	B*0562	B*0563	B*0564	B*0565	B*0566	B*0567	B*0568	B*0569	B*0570	B*0571	B*0572	B*0573	B*0574	B*0575	B*0576	B*0577	B*0578	B*0579	B*0580	B*0581	B*0582	B*0583	B*0584	B*0585	B*0586	B*0587	B*0588	B*0589	B*0590	B*0591	B*0592	B*0593	B*0594	B*0595	B*0596	B*0597	B*0598	B*0599	B*0600	B*0601	B*0602	B*0603	B*0604	B*0605	B*0606	B*0607	B*0608	B*0609	B*0610	B*0611	B*0612	B*0613	B*0614	B*0615	B*0616	B*0617	B*0618	B*0619	B*0620	B*0621	B*0622	B*0623	B*0624	B*0625	B*0626	B*0627	B*0628	B*0629	B*0630	B*0631	B*0632	B*0633	B*0634	B*0635	B*0636	B*0637	B*0638	B*0639	B*0640	B*0641	B*0642	B*0643	B*0644	B*0645	B*0646	B*0647	B*0648	B*0649	B*0650	B*0651	B*0652	B*0653	B*0654	B*0655	B*0656	B*0657	B*0658	B*0659	B*0660	B*0661	B*0662	B*0663	B*0664	B*0665	B*0666	B*0667	B*0668	B*0669	B*0670	B*0671	B*0672	B*0673	B*0674	B*0675	B*0676	B*0677	B*0678	B*0679	B*0680	B*0681	B*0682	B*0683	B*0684	B*0685	B*0686	B*0687	B*0688	B*0689	B*0690	B*0691	B*0692	B*0693	B*0694	B*0695	B*0696	B*0697	B*0698	B*0699	B*0700	B*0701	B*0702	B*0703	B*0704	B*0705	B*0706	B*0707	B*0708	B*0709	B*0710	B*0711	B*0712	B*0713	B*0714	B*0715	B*0716	B*0717	B*0718	B*0719	B*0720	B*0721	B*0722	B*0723	B*0724	B*0725	B*0726	B*0727	B*0728	B*0729	B*0730	B*0731	B*0732	B*0733	B*0734	B*0735	B*0736	B*0737	B*0738	B*0739	B*0740	B*0741	B*0742	B*0743	B*0744	B*0745	B*0746	B*0747	B*0748	B*0749	B*0750	B*0751	B*0752	B*0753	B*0754	B*0755	B*0756	B*0757	B*0758	B*0759	B*0760	B*0761	B*0762	B*0763	B*0764	B*0765	B*0766	B*0767	B*0768	B*0769	B*0770	B*0771	B*0772	B*0773	B*0774	B*0775	B*0776	B*0777	B*0778	B*0779	B*0780	B*0781	B*0782	B*0783	B*0784	B*0785	B*0786	B*0787	B*0788	B*0789	B*0790	B*0791	B*0792	B*0793	B*0794	B*0795	B*0796	B*0797	B*0798	B*0799	B*0800	B*0801	B*0802	B*0803	B*0804	B*0805	B*0806	B*0807	B*0808	B*0809	B*0810	B*0811	B*0812	B*0813	B*0814	B*0815	B*0816	B*0817	B*0818	B*0819	B*0820	B*0821	B*0822	B*0823	B*0824	B*0825	B*0826	B*0827	B*0828	B*0829	B*0830	B*0831	B*0832	B*0833	B*0834	B*0835	B*0836	B*0837	B*0838	B*0839	B*0840	B*0841	B*0842	B*0843	B*0844	B*0845	B*0846	B*0847	B*0848	B*0849	B*0850	B*0851	B*0852	B*0853	B*0854	B*0855	B*0856	B*0857	B*0858	B*0859	B*0860	B*0861	B*0862	B*0863	B*0864	B*0865	B*0866	B*0867	B*0868	B*0869	B*0870	B*0871	B*0872	B*0873	B*0874	B*0875	B*0876	B*0877	B*0878	B*0879	B*0880	B*0881	B*0882	B*0883	B*0884	B*0885	B*0886	B*0887	B*0888	B*0889	B*0890	B*0891	B*0892	B*0893	B*0894	B*0895	B*0896	B*0897	B*0898	B*0899	B*0900	B*0901	B*0902	B*0903	B*0904	B*0905	B*0906	B*0907	B*0908	B*0909	B*0910	B*0911	B*0912	B*0913	B*0914	B*0915	B*0916	B*0917	B*0918	B*0919	B*0920	B*0921	B*0922	B*0923	B*0924	B*0925	B*0926	B*0927	B*0928	B*0929	B*0930	B*0931	B*0932	B*0933	B*0934	B*0935	B*0936	B*0937	B*0938	B*0939	B*0940	B*0941	B*0942	B*0943	B*0944	B*0945	B*0946	B*0947	B*0948	B*0949	B*0950	B*0951	B*0952	B*0953	B*0954	B*0955	B*0956	B*0957	B*0958	B*0959	B*0960	B*0961	B*0962	B*0963	B*0964	B*0965	B*0966	B*0967	B*0968	B*0969	B*0970	B*0971	B*0972	B*0973	B*0974	B*0975	B*0976	B*0977	B*0978	B*0979	B*0980	B*0981	B*0982	B*0983	B*0984	B*0985	B*0986	B*0987	B*0988	B*0989	B*0990	B*0991	B*0992	B*0993	B*0994	B*0995	B*0996	B*0997	B*0998	B*0999	B*1000	B*1001	B*1002	B*1003	B*1004	B*1005	B*1006	B*1007	B*1008	B*1009	B*1010	B*1011	B*1012	B*1013	B*1014	B*1015	B*1016	B*1017	B*1018	B*1019	B*1020	B*1021	B*1022	B*1023	B*1024	B*1025	B*1026	B*1027	B*1028	B*1029	B*1030	B*1031	B*1032	B*1033	B*1034	B*1035	B*1036	B*1037	B*1038	B*1039	B*1040	B*1041	B*1042	B*1043	B*1044	B*1045	B*1046	B*1047	B*1048	B*1049	B*1050	B*1051	B*1052	B*1053	B*1054	B*1055	B*1056	B*1057	B*1058	B*1059	B*1060	B*1061	B*1062	B*1063	B*1064	B*1065	B*1066	B*1067	B*1068	B*1069	B*1070	B*1071	B*1072	B*1073	B*1074	B*1075	B*1076	B*1077	B*1078	B*1079	B*1080	B*1081	B*1082	B*1083	B*1084	B*1085	B*1086	B*1087	B*1088	B*1089	B*1090	B*1091	B*1092	B*1093	B*1094	B*1095	B*1096	B*1097	B*1098	B*1099	B*1100	B*1101	B*1102	B*1103	B*1104	B*1105	B*1106	B*1107	B*1108	B*1109	B*1110	B*1111	B*1112	B*1113	B*1114	B*1115	B*1116	B*1117	B*1118	B*1119	B*1120	B*1121	B*1122	B*1123	B*1124	B*1125	B*1126	B*1127	B*1128	B*1129	B*1130	B*1131	B*1132	B*1133	B*1134	B*1135	B*1136	B*1137	B*1138	B*1139	B*1140	B*1141	B*1142	B*1143	B*1144	B*1145	B*1146	B*1147	B*1148	B*1149	B*1150	B*1151	B*1152	B*1153	B*1154	B*1155	B*1156	B*1157	B*1158	B*1159	B*1160	B*1161	B*1162	B*1163	B*1164	B*1165	B*1166	B*1167	B*1168	B*1169	B*1170	B*1171	B*1172	B*1173	B*1174	B*1175	B*1176	B*1177	B*1178	B*1179	B*1180	B*1181	B*1182	B*1183	B*1184	B*1185	B*1186	B*1187	B*1188	B*1189	B*1190	B*1191	B*1192	B*1193	B*1194	B*1195	B*1196	B*1197	B*1198	B*1199	B*1200	B*1201	B*1202	B*1203	B*1204	B*1205	B*1206	B*1207	B*1208	B*1209	B*1210	B*1211	B*1212	B*1213	B*1214	B*1215	B*1216	B*1217	B*1218	B*1219	B*1220	B*1221	B*1222	B*1223	B*1224	B*1225	B*1226	B*1227	B*1228	B*1229	B*1230	B*1231	B*1232	B*1233	B*1234	B*1235	B*1236	B*1237	B*1238	B*1239	B*1240	B*1241	B*1242	B*1243	B*1244	B*1245	B*1246	B*1247	B*1248	B*1249	B*1250	B*1251	B*1252	B*1253	B*1254	B*1255	B*1256	B*1257	B*1258	B*1259	B*1260	B*1261	B*1262	B*1263	B*1264	B*1265	B*1266	B*1267	B*1268	B*1269	B*1270	B*1271	B*1272	B*1273	B*1274	B*1275	B*1276	B*1277	B*1278	B*1279	B*1280	B*1281	B*1282	B*1283	B*1284	B*1285	B*1286	B*1287	B*1288	B*1289	B*1290	B*1291	B*1292	B*1293	B*1294	B*1295	B*1296	B*1297	B*1298	B*1299	B*1300	B*1301	B*1302	B*1303	B*1304	B*1305	B*1306	B*1307	B*1308	B*1309	B*1310	B*1311	B*1312	B*1313	B*1314	B*1315	B*1316	B*1317	B*1318	B*1319	B*1320	B*1321	B*1322	B*1323	B*1324	B*1325	B*1326	B*1327	B*1328	B*1329	B*1330	B*1331	B*1332	B*1333	B*1334	B*1335	B*1336	B*1337	B*
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- If a sample appears to have alleles in the same serology group refer to the **serology group chart**, and select probes that could separate alleles within the group.

[illegible]

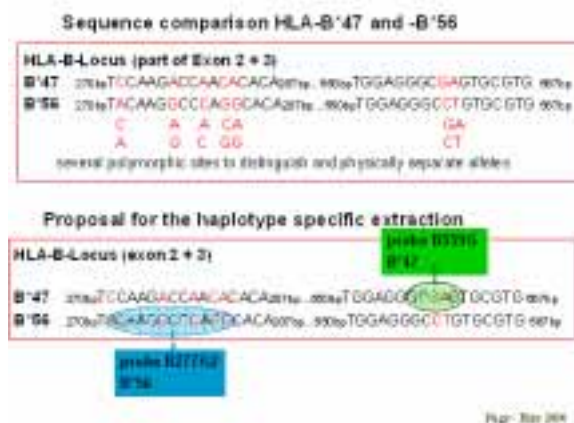
- The **probe matrix chart** lists probes that will separate allele combinations from different serology groups. Find the serology group of one allele in the top row of the chart. The serology groups in this first row are referred to as Group One. Find the second serology group of the mixture in the first column down the left side of the chart. Serology groups in this column are referred to as Group Two. Probes which will target most of the alleles within serology Group One are designated by white intersecting cells in the matrix. Probes which target Group Two are designated by grey intersecting cells. **Any probe listed in bold may capture alleles from both groups and should be investigated in the allele level chart before using to separate a sample.**

- |     |        |              |
|-----|--------|--------------|
| x/y | B7     |              |
|     | B7     |              |
|     |        |              |
| B8  | B559G  | <b>B277A</b> |
|     | B277G1 |              |
|     | B277G2 |              |
| B13 | B261C  | <b>B261G</b> |
|     | B277G1 |              |
|     | B277G2 |              |
| B14 | B559G  | <b>B277A</b> |
|     | B277G1 |              |
|     | B277G2 |              |
| B40 | B277G1 | <b>B277A</b> |
|     | B277G2 | <b>B261G</b> |
|     |        |              |
| B41 | B261C  | <b>B277A</b> |
|     | B559G  | <b>B539A</b> |
|     | B277G1 |              |
| B42 | B559G  | <b>B539A</b> |
|     |        |              |
|     |        |              |
| B44 | B277G1 | <b>B277A</b> |
|     | B277G2 | <b>B261G</b> |
|     |        |              |

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- For example: If the sample has a low-resolution type of HLA-B\*14xx and HLA-B\*15xx, the matrix chart lists probe B559C if you select B14 from the top row (group one) and B15 from the first column (group two) of the chart. Probe B559C will extract the B15 alleles. An empty cell indicates that there is no probe that will extract B14xx discretely from B15 alleles. However, if you refer to the Serology Group Chart, probe B261C will extract all of the B14 and will not extract the majority of B15 alleles: 15010101-150104, 1503-1507, 1512, 1514, ...1579. If it were determined that the sample had a HLA-B\*1502, then probe B355C could be used to isolate the B14 allele.
- An alternative to using the charts included here, especially when choosing probes to separate samples with multiple possible allele combinations, would be to manually identify the polymorphic nucleotide positions and unique sequence elements between alleles which are targeted by HSE probes. Sequence alignment tools, available online from the European Bioinformatics Institute for the IMGT/HLA community at <http://www.ebi.ac.uk/imgt/hla/align.html>, can be used to align alleles, identify the polymorphic nucleotide positions and unique sequence elements between them, and match these to HSE probes.

- For example, the probe B559C targets polymorphic positions centered at the nucleotide position 559 (exon 3) that contain the target sequence GCGAG. A sample with low-resolution types HLA-B\*47xx, HLA-B\*56xx can be resolved.



Enter the alleles into the box for specific sequences requested as shown below.

IMGT/HLA Sequence Database

The latest version of the alignment tool now includes genomic sequences as well as alignments of previously sequenced regions. Where discrepancies have arisen between reported sequences and those stored in the database, the original authors have been contacted where possible, and necessary amendments to published sequences have been incorporated into this alignment. Future sequencing may identify errors in this list and the IMGT/HLA community would welcome any evidence that helps to maintain the accuracy of these sequence alignments.

Information: Experts users should be aware that a bug has been reported in the program that automatically retrieves shared alignment parameters. This bug poses no security risk, but does mean that you may have to refresh the page before performing further alignments, or are currently looking into this problem. Alternative browsers like Firefox have no reported bugs with the program.

IMGT/HLA Sequence Database Alignment Tool

Select Locus:	B*47	1999
Select the reference allele:	Nucleotide - CDS	1999
Enter any specific sequences to align:	47_55	1999
Enter the reference sequence:	47_55	1999
Select format to display alignment:	Show formatted between sequences	1999
Select how the alignment will be displayed:	In Exons - nucleotide sequence displayed in codons	1999
What allele discrepancy for this region:	Only unsequenced alleles	1999
Select type of output:	Plain text, ideal for cut & paste	1999
Processed with alignment:	Align Sequences Now	1999



The database will return sequence alignments showing mismatches between alleles as well as the exon nucleotide positions which correlate to HSE probes. Inspection of the mismatches aligned in this search reveals HLA-B\*47xx matches the unique sequence element listed for HSE probe B559G while B56 alleles do not. HLA-B\*56xx similarly matches HSE probe B277G2.

	510	520	530	540	550	560	570	580	590	600
D*070251	CCAGCCCAAG	TSAGAGGCGG	CCCGTGAAGC	GGAGGAGCGG	AGAGGCTAAC	TGAGAGGCGG	TTGCTGAGAG	TTGCTGCGCA	GAAGCTGGA	GAAGCGGAAG
B*47015102	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*4702	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*4703	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*4704	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*4705	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5601	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5602	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5603	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5604	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5605	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5606	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5607	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5608	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5609	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5610	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5611	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5612	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5613	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5614	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5615	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B*5616	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

## HLA-Cw Probe Matrix Charts:

		Allele1		Allele1		Allele1		Allele1	
		Cw*01		Cw*02		Cw*03		Cw*04	
Allele2	Cw*01			Cw142G	Cw103T	Cw142G	Cw103T	Cw142G	Cw312C
				Cw559G	Cw312C	Cw355A	Cw486C	Cw419T	Cw486C
				Cw102C	Cw486C	Cw102C		Cw302A	
Allele2	Cw*02	Cw103T	Cw142G			Cw355A	Cw539G	Cw419T	Cw102C
		Cw312C	Cw302A			Cw559C	Cw302A	Cw103T	Cw419C
		Cw486C	Cw559G			Cw312C	Cw419C	Cw486G	Cw559G
Allele2	Cw*03	Cw103T	Cw102C	Cw539G	Cw355A			Cw103T	Cw355A
		Cw486C	Cw486G	Cw559G	Cw559C			Cw419T	Cw559C
			Cw559C	Cw419C	Cw312C			Cw302A	Cw102C
Allele2	Cw*04	Cw486C	Cw142G	Cw539G	Cw419T	Cw102C	Cw103T		
		Cw312C	Cw419T	Cw419C	Cw103T	Cw355A	Cw419T		
			Cw302A	Cw559G	Cw486G	Cw559C	Cw302A		
Allele2	Cw*05	Cw103T	Cw102C	Cw176G	Cw419T	Cw176G	Cw176A	Cw103T	Cw102C
		Cw312C	Cw142G	Cw539G		Cw355A	Cw302A	Cw176G	
		Cw486C		Cw559G		Cw312C	Cw419T	Cw486G	
Allele2	Cw*06	Cw103T	Cw102C	Cw142G	Cw97G	Cw142G	Cw97G	Cw142G	Cw97G
		Cw486C	Cw97G	Cw559G	Cw486G	Cw355A	Cw539G	Cw103T	Cw539G
		Cw312C	Cw302A			Cw559C	Cw302A	Cw419T	Cw419C
Allele2	Cw*07	Cw103T	Cw102C	Cw142G	Cw97G	Cw142G	Cw97G	Cw103T	Cw102C
			Cw97G	Cw539G	Cw312C	Cw355A	Cw419C	Cw142G	Cw97G
			Cw419C	Cw559G	Cw486C	Cw559G	Cw486C	Cw486G	Cw486C
Allele2	Cw*08	Cw103T	Cw102C	Cw176G		Cw176G		Cw176G	Cw102C
		Cw176G	Cw142G	Cw539G	Cw312C	Cw355A	Cw419T	Cw103T	
		Cw486C		Cw559G	Cw419T	Cw559C		Cw302A	Cw312C
Allele2	Cw*12	Cw103T	Cw102C	Cw559G	Cw312C	Cw355A	Cw539G	Cw419T	Cw312C
		Cw486C	Cw142G	Cw302A	Cw486G	Cw559C	Cw419C	Cw103T	Cw419C
			Cw419C					Cw302A	Cw539G
Allele2	Cw*14	Cw486C	Cw142G	Cw539G	Cw103T	Cw355A	Cw103T	Cw419T	Cw419C
			Cw419C	Cw559G	Cw312C	Cw559C	Cw419C	Cw302A	Cw312C
			Cw486G	Cw102C	Cw486G	Cw102C			
Allele2	Cw*15	Cw103T	Cw142G	Cw539G	Cw355A	Cw559C	Cw302A	Cw103T	Cw355A
		Cw486C	Cw355A	Cw419C	Cw419T	Cw312C	Cw419T		Cw102C
		Cw312C	Cw302A	Cw559G	Cw486G				
Allele2	Cw*16	Cw103T	Cw102C	Cw539G	Cw312C	Cw355A	Cw419C	Cw419T	Cw102C
		Cw486C	Cw142G	Cw559G	Cw486G	Cw559C		Cw103T	Cw419C
			Cw419C	Cw302A		Cw312C		Cw302A	Cw312C
Allele2	Cw*17	Cw103T	Cw102C	Cw539G	Cw419T	Cw312C	Cw559G	Cw103T	Cw102C
		Cw312C	Cw142G	Cw419C		Cw355A	Cw419T		
		Cw486C	Cw302A			Cw559C	Cw302A		
Allele2	Cw*18	Cw103T	Cw97G	Cw142G	Cw97G	Cw142G	Cw97G	Cw142G	Cw97G
		Cw486C	Cw102C	Cw539G	Cw419T	Cw559C	Cw302A	Cw103T	Cw102C
		Cw312C	Cw302A	Cw419C	Cw486G	Cw355A	Cw419T		

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	Allele1		Allele1		Allele1		Allele1	
	Cw*05		Cw*06		Cw*07		Cw*08	
Allele2	Cw*01	Cw102C Cw142G	Cw103T Cw486C Cw312C	Cw97G Cw102C Cw302A	Cw103T <b>Cw312C</b> Cw486C	Cw102C Cw97G <b>Cw419C</b>	Cw103T Cw142G	Cw102C Cw103T Cw176G Cw486C
Allele2	Cw*02	<b>Cw419T</b> -----	<b>Cw176G</b> <b>Cw539G</b> Cw559G	Cw97G Cw142G	Cw142G Cw97G Cw312C Cw486C	<b>Cw142G</b> <b>Cw539G</b> <b>Cw302A</b>	Cw176A Cw312C	Cw559G Cw539G Cw176G
Allele2	Cw*03	<b>Cw302A</b> <b>Cw419T</b>	Cw312C <b>Cw176G</b> <b>Cw355A</b>	Cw97G Cw539G <b>Cw302A</b>	Cw142G Cw355A Cw559C	Cw97G <b>Cw486C</b> <b>Cw419C</b>	<b>Cw142G</b> <b>Cw355A</b> Cw559C	Cw176G Cw355A Cw559C
Allele2	Cw*04	<b>Cw102C</b>	Cw103T <b>Cw176G</b> <b>Cw486G</b>	Cw97G Cw539G Cw419C	Cw142G Cw103T <b>Cw419T</b>	Cw486C Cw97G Cw419C	Cw103T <b>Cw102C</b> <b>Cw312C</b>	Cw176G Cw103T <b>Cw302A</b>
Allele2	Cw*05			Cw97G <b>Cw176G</b> <b>Cw419C</b>	Cw142G <b>Cw419T</b>	Cw97G Cw312C Cw486C <b>Cw142G</b> <b>Cw419T</b>	Cw312C <b>Cw486G</b>	<b>Cw302A</b>
Allele2	Cw*06					Cw486C <b>Cw312C</b> Cw486G <b>Cw302A</b> <b>Cw539G</b>	Cw142G <b>Cw312C</b>	Cw97G Cw176G Cw539G
Allele2	Cw*07	<b>Cw142G</b> <b>Cw419T</b>	Cw97G <b>Cw176G</b> Cw486C	Cw486G <b>Cw302A</b> Cw539G	Cw486C <b>Cw312C</b>			Cw176G Cw97G Cw486C
Allele2	Cw*08	<b>Cw302A</b>	Cw312C <b>Cw486G</b>	Cw97G Cw176G Cw539G	Cw142G <b>Cw312C</b>	Cw176G Cw97G Cw486C <b>Cw419T</b>		
Allele2	Cw*12	Cw419T <b>Cw302A</b>	<b>Cw176G</b> <b>Cw419C</b> <b>Cw539G</b>	Cw97G <b>Cw302A</b>	Cw142G <b>Cw312C</b>	Cw97G <b>Cw486C</b> <b>Cw539G</b>	----- Cw419T	Cw176G Cw539G <b>Cw419C</b>
Allele2	Cw*14	Cw102C Cw419T Cw176G	Cw103T Cw312C <b>Cw419C</b>	Cw97G Cw102C Cw539G	Cw103T Cw142G <b>Cw312C</b>	Cw102C Cw97G Cw486C	Cw103T <b>Cw142G</b> Cw486G Cw419T	Cw103T Cw176G <b>Cw419C</b>
Allele2	Cw*15		<b>Cw176G</b> <b>Cw355A</b> <b>Cw486G</b>	Cw97G Cw539G <b>Cw419C</b>	Cw142G Cw355A <b>Cw419T</b>	Cw97G Cw486C <b>Cw312C</b> <b>Cw419T</b>	<b>Cw302A</b> <b>Cw312C</b>	Cw176G Cw355A <b>Cw302A</b>
Allele2	Cw*16	Cw419T ----- <b>Cw302A</b>	<b>Cw176G</b> <b>Cw419C</b> Cw312C	Cw97G <b>Cw302A</b> <b>Cw539G</b>	Cw142G <b>Cw312C</b>	Cw97G Cw486C	<b>Cw142G</b> Cw486G Cw419T	Cw176G <b>Cw419C</b>
Allele2	Cw*17		<b>Cw176G</b> Cw559G Cw486G	Cw97G Cw419C <b>Cw539G</b>	Cw142G <b>Cw419T</b> <b>Cw559G</b>	Cw97G Cw419C Cw312C	Cw486G <b>Cw419T</b> <b>Cw302A</b>	Cw176G Cw312C Cw559G
Allele2	Cw*18	Cw142G	Cw97G <b>Cw176G</b> <b>Cw486G</b>	Cw419C Cw539G	<b>Cw419T</b>	Cw419C Cw312C Cw486C	<b>Cw419T</b> <b>Cw302A</b> Cw486G	Cw142G Cw97G Cw176G Cw312C <b>Cw302A</b>

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		Allele1		Allele1		Allele1		Allele1	
		Cw*12		Cw*14		Cw*15		Cw*16	
Allele2	Cw*01	Cw102C	Cw103T	Cw142G	Cw486C	Cw142G	Cw103T	Cw102C	Cw103T
		Cw142G	<b>Cw486C</b>	<b>Cw419C</b>		Cw355A	<b>Cw312C</b>	Cw142G	Cw486C
		<b>Cw419C</b>		<b>Cw486G</b>		Cw302A	<b>Cw486C</b>	<b>Cw419C</b>	
Allele2	Cw*02	Cw312C	<b>Cw302A</b>	Cw103T	Cw539G	Cw355A	Cw539G	Cw312C	<b>Cw539G</b>
		<b>Cw486G</b>	Cw559G	Cw312C	Cw102C	<b>Cw419T</b>	Cw559G	<b>Cw486G</b>	<b>Cw302A</b>
			<b>Cw486G</b>	Cw559G	<b>Cw486G</b>	<b>Cw419C</b>		Cw559G	
Allele2	Cw*03	Cw539G	Cw355A	Cw103T	Cw355A	<b>Cw302A</b>	Cw559C	<b>Cw419C</b>	Cw355A
		<b>Cw419C</b>	Cw559C	<b>Cw419C</b>	Cw559C	<b>Cw419T</b>	<b>Cw312C</b>		Cw559C
			Cw102C					<b>Cw312C</b>	
Allele2	Cw*04	<b>Cw102C</b>	Cw419T	Cw419C	Cw419T	Cw355A	Cw103T	<b>Cw102C</b>	Cw419T
		Cw419C	Cw103T	<b>Cw312C</b>	<b>Cw302A</b>	<b>Cw102C</b>		Cw419C	Cw103T
		Cw539G	<b>Cw302A</b>					<b>Cw312C</b>	<b>Cw302A</b>
Allele2	Cw*05	Cw312C	Cw419T	Cw103T	Cw102C	<b>Cw176G</b>		<b>Cw176G</b>	Cw419T
		<b>Cw419C</b>		Cw312C	Cw419T	<b>Cw355A</b>		<b>Cw419C</b>	
		<b>Cw539G</b>	<b>Cw302A</b>	<b>Cw419C</b>		<b>Cw486G</b>		Cw312C	<b>Cw302A</b>
Allele2	Cw*06	Cw142G	Cw97G	Cw103T	Cw97G	Cw142G	Cw97G	Cw142G	Cw97G
		<b>Cw312C</b>	<b>Cw302A</b>	Cw142G	Cw102C	Cw355A	Cw539G	<b>Cw312C</b>	<b>Cw302A</b>
			<b>Cw312C</b>	Cw539G	<b>Cw419T</b>	<b>Cw419C</b>		<b>Cw539G</b>	
Allele2	Cw*07	<b>Cw142G</b>	Cw97G	Cw103T	Cw102C	Cw486G	Cw97G	<b>Cw142G</b>	Cw97G
		<b>Cw539G</b>	<b>Cw486C</b>	<b>Cw142G</b>	Cw97G	<b>Cw302A</b>	<b>Cw312C</b>	Cw486G	Cw486C
			Cw486G	Cw486C	<b>Cw355A</b>	<b>Cw419C</b>			
Allele2	Cw*08	Cw176G		Cw103T	Cw102C	Cw176G		Cw176G	
		Cw539G	Cw419T	Cw176G	Cw176A	Cw355A	<b>Cw312C</b>	<b>Cw419C</b>	Cw419T
		<b>Cw419C</b>		<b>Cw419C</b>	Cw419T	<b>Cw302A</b>			
Allele2	Cw*12			Cw103T	Cw102C	Cw355A	Cw539G		<b>Cw539G</b>
					Cw539G	<b>Cw302A</b>	<b>Cw419C</b>		
					Cw419T	<b>Cw312C</b>			
Allele2	Cw*14	Cw102C	Cw103T			Cw355A	Cw103T	Cw102C	Cw103T
		Cw539G				Cw102C	<b>Cw419C</b>		
						Cw419T	<b>Cw312C</b>		
Allele2	Cw*15	Cw539G	Cw355A	Cw103T	Cw355A			<b>Cw419C</b>	Cw355A
		<b>Cw419C</b>	<b>Cw302A</b>	<b>Cw419C</b>	Cw102C			<b>Cw312C</b>	<b>Cw302A</b>
		<b>Cw312C</b>	Cw419T	<b>Cw312C</b>	Cw419T				Cw419T
Allele2	Cw*16	<b>Cw539G</b>		Cw103T	Cw102C	Cw355A	<b>Cw419C</b>		
						<b>Cw302A</b>	<b>Cw312C</b>		
					Cw419T				
Allele2	Cw*17	Cw419C	Cw419T	Cw103T	Cw102C	Cw355A	Cw559G	Cw419C	Cw419T
		Cw312C	<b>Cw302A</b>	Cw419C	Cw419T			Cw312C	<b>Cw302A</b>
		Cw539G	Cw559G	Cw312C	Cw559G				Cw559G
Allele2	Cw*18	Cw142G	Cw97G	Cw103T	Cw97G	Cw142G	Cw97G	Cw142G	Cw97G
		Cw419C	Cw419T	Cw142G	Cw102C	Cw355A		Cw419C	Cw419T
		Cw539G	<b>Cw302A</b>	Cw419C	Cw419T			Cw312C	<b>Cw302A</b>

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		Allele1		Allele1	
		Cw*17		Cw*18	
Allele2	Cw*01	Cw102C	Cw103T	Cw97G	Cw103T
		Cw142G	Cw312C	Cw102C	Cw419C
		Cw302A	Cw486	Cw302A	Cw486C
Allele2	Cw*02	<b>Cw419T</b>		Cw539G	Cw97G
			Cw419C	<b>Cw419T</b>	Cw142G
Allele2	Cw*03	<b>Cw419T</b>		Cw355A	Cw97G
		<b>Cw302A</b>		Cw559C	<b>Cw102C</b>
				<b>Cw419T</b>	Cw559C
Allele2	Cw*04	Cw102C	Cw103T	Cw97G	Cw142G
				<b>Cw102C</b>	Cw103T
Allele2	Cw*05	<b>Cw176G</b>		Cw97G	Cw142G
		Cw559G		<b>Cw176G</b>	
Allele2	Cw*06	Cw142G	Cw97G	<b>Cw419T</b>	Cw419C
			Cw419C		Cw539G
Allele2	Cw*07	Cw486G	Cw97G	Cw486G	Cw419C
		<b>Cw419T</b>	Cw312C	<b>Cw302A</b>	Cw312C
		<b>Cw559G</b>	Cw419C	<b>Cw419T</b>	Cw486C
Allele2	Cw*08	Cw176G		Cw97G	Cw142G
		Cw559G	Cw312C	Cw176G	
		<b>Cw302A</b>		<b>Cw302A</b>	Cw312C
Allele2	Cw*12	Cw419T	Cw419C	Cw97G	Cw142G
		<b>Cw302A</b>	Cw312C	Cw419T	Cw419C
		Cw559G	Cw539G	<b>Cw302A</b>	Cw539G
Allele2	Cw*14	Cw102C	Cw103T	Cw97G	Cw103T
		Cw419T	Cw419C	Cw102C	Cw142G
		Cw559G	Cw312C	Cw419T	Cw419C
Allele2	Cw*15	Cw559G	Cw355A	Cw97G	Cw142G
					Cw355A
Allele2	Cw*16	Cw419T	Cw419C	Cw97G	Cw142G
		<b>Cw302A</b>	Cw312C	Cw419T	Cw419C
		Cw559G		<b>Cw302A</b>	Cw312C
Allele2	Cw*17			Cw97G	Cw142G
Allele2	Cw*18	Cw142G	Cw97G		

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**HLA-Cw Serology Group Chart:**

Allele	Probe	Alleles Not Targeted
Cw 01	Cw103T	
	Cw176G	
	Cw312C	
	Cw486C	Cw*0104
	Cw419T	Cw*010201, 010202, 0104-0110
	Cw539G	Cw*010201-0103, 0105-0108, 0110
	Cw559Gr	Cw*010201-0109
	Cw419C	Cw*010201-0103, 0105-0110
Cw 02	Cw142G	
	Cw176G	
	Cw103C	
	Cw302A	
	Cw559G	
	Cw539G	Cw*0203
	Cw419C	Cw*0206, 0207
	Cw419T	Cw*020201-0205, 0207-0209
	Cw486G	Cw*020201-020203, 0203-0204, 0207-0209
Cw 03	Cw176G	
	Cw103C	
	Cw142G	Cw*0311
	Cw486G	Cw*0314
	Cw312C	Cw*0307, 0315
	Cw559C	Cw*0314, 0316
	Cw355A	Cw*030201, 030202, 0305, 0313, 0315-0317
	Cw419C	Cw*030301-0313, 0317, 0318
	Cw302A	Cw*030101-0306, 0308-0314, 0316-0318
	Cw419T	Cw*030201-0311, 0313-0318
	Cw486C	Cw*030201-0313, 0315-0318
Cw 04	Cw142G	
	Cw176G	
	Cw419T	
	Cw302A	Cw*04010102
	Cw486G	Cw*04010102
	Cw103T	Cw*0403, 0406
	Cw103C	Cw*04010101-040102, 040401-040405, 0407-0415
	Cw312C	Cw*04010101-0410, 0412-0415
	Cw559C	Cw*04010101-0407, 0409N-0415

Allele	Probe	Alleles Not Targeted
Cw 05	Cw102C	
	Cw302A	
	Cw142G	
	Cw419T	Cw*0504
	Cw486G	Cw*050102-0510
	Cw176G	Cw*0501-0508
	Cw419C	Cw*0501-0503, 0505-0510
	Cw355A	Cw*0501-0509
	Cw539G	Cw*0501-0507N, 0509, 0510
Cw06	Cw486G	
	Cw102C	
	Cw97G	Cw*0603
	Cw176G	Cw*0605
	Cw419C	Cw*0609
	Cw302A	Cw*0611
	Cw539G	Cw*0604-0606
	Cw559G	Cw*0602-0607, 0609-0611
	Cw419T	Cw*0602-0608, 0610, 0611
	Cw312C	Cw*0602-0610
Cw 07	Cw102C	
	Cw176G	
	Cw97G	Cw*0726
	Cw486C	Cw*07020102, 07020103
	Cw312C	Cw*0707, 0709
	Cw419C	Cw*070401, 070402, 0711-0713, 0728, 0729
	Cw419T	Cw*070101-0703, 0705-0710, 0714-0727, 0729
	Cw302A	Cw*070101-0706, 0708, 0710-0729
	Cw142G	Cw*070101-0719, 0721-0729
	Cw355A	Cw*070101-0709, 0711-0729
	Cw559G	Cw*070101-0714, 0716-0729
	Cw539G	Cw*070101-0721, 0723-0729
Cw 08	Cw102C	
	Cw142G	
	Cw312C	Cw*0810
	Cw419T	Cw*0809, 0811
	Cw486G	Cw*0802, 0804, 0805, 0807, 0812
	Cw419C	Cw*080101-0808, 0810, 0812
	Cw302A	Cw*080101-0809, 0811, 0812

Allele	Probe	Alleles Not Targeted
Cw 12	Cw102C	
	Cw142G	
	Cw486G	
	Cw176G	
	Cw419C	Cw*1215
	Cw539G	Cw*1209, 1214
	Cw312C	Cw*120401-1205, 1209
	Cw302A	Cw*120201-120303, 1206-1208, 1210-1215
	Cw486C	Cw*120201-1213, 1215
Cw 14	Cw103T	
	Cw142G	
	Cw176G	
	Cw419C	
	Cw312C	
	Cw486G	
	Cw302A	Cw*140201-1403, 1405
Cw 15	Cw142G	
	Cw176G	
	Cw486G	
	Cw355A	
	Cw302A	Cw*1507
	Cw102C	Cw*1510
	Cw419T	Cw*150201, 1504, 1506, 1509
	Cw419C	Cw*150201-1503, 150501-1508, 1510-1512
	Cw312C	Cw*150201- 1506, 1508- 1512
	Cw102C	Cw*150201- 1509, 1511
Cw 16	Cw102C	
	Cw142G	
	Cw176G	
	Cw419C	
	Cw486G	
	Cw312C	Cw*1602
	Cw302A	Cw*1601, 160401, 1606
	Cw539G	Cw*1601, 1602, 1606
Cw 17	Cw102C	
	Cw142G	
	Cw176G	
	Cw419T	
	Cw559G	
	Cw486G	
	Cw302A	



Allele	Probe	Alleles Not Targeted
Cw 18	Cw97G	
	Cw102C	
	Cw176G	
	Cw302A	
	Cw486G	
	Cw419T	

## HLA-Cw Allele Level Chart:

	97G	102C	103T	142G	176G	419C	419T	355A	539G	302A	312C	486G	486C	559G	559C
Cw*010201															
Cw*010202															
Cw*0103															
Cw*0104															
Cw*0105															
Cw*0106															
Cw*0107															
Cw*0108															
Cw*0109															
Cw*0110															
Cw*020201															
Cw*020202															
Cw*020203															
Cw*020204															
Cw*020205															
Cw*0203															
Cw*0204															
Cw*0205															
Cw*0206															
Cw*0207															
Cw*0208															
Cw*0209															
Cw*030201															
Cw*030202															
Cw*030301															
Cw*030302															
Cw*030303															
Cw*030304															
Cw*030401															
Cw*030402															
Cw*030403															
Cw*0305															
Cw*0306															
Cw*0307															
Cw*0308															
Cw*0309															
Cw*0310															
Cw*0311															
Cw*0312															
Cw*0313															
Cw*0314															
Cw*0315															
Cw*0316															
Cw*0317															
Cw*0318															

	97G	102C	103T	142G	176G	419C	419T	355A	539G	302A	312C	486G	486C	559G	559C
Cw*04010101															
Cw*04010102															
Cw*040102															
Cw*0403															
Cw*040401															
Cw*040402															
Cw*0405															
Cw*0406															
Cw*0407															
Cw*0408															
Cw*0409N															
Cw*0410															
Cw*0411															
Cw*0412															
Cw*0413															
Cw*0414															
Cw*0415															
Cw*0501															
Cw*050102															
Cw*0502															
Cw*0503															
Cw*0504															
Cw*0505															
Cw*0506															
Cw*0507N															
Cw*0508															
Cw*0509															
Cw*0510															
Cw*0602															
Cw*0603															
Cw*0604															
Cw*0605															
Cw*0606															
Cw*0607															
Cw*0608															
Cw*0609															
Cw*0610															
Cw*0611															

	97G	102C	103T	142G	176G	419C	419T	355A	539G	302A	312C	486G	486C	559G	559C
Cw*070101															
Cw*070102															
Cw*070103															
Cw*07020101															
Cw*07020102															
Cw*07020103															
Cw*0703															
Cw*070401															
Cw*070402															
Cw*0705															
Cw*0706															
Cw*0707															
Cw*0708															
Cw*0709															
Cw*0710															
Cw*0711															
Cw*0712															
Cw*0713															
Cw*0714															
Cw*0715															
Cw*0716															
Cw*0717															
Cw*0718															
Cw*0719															
Cw*0720															
Cw*0721															
Cw*0722															
Cw*0723															
Cw*0724															
Cw*0725															
Cw*0726															
Cw*0727															
Cw*0728															
Cw*0729															
Cw*080101															
Cw*080102															
Cw*0802															
Cw*0803															
Cw*0804															
Cw*0805															
Cw*0806															
Cw*0807															
Cw*0808															
Cw*0809															
Cw*0810															
Cw*0811															
Cw*0812															

	97G	102C	103T	142G	176G	419C	419T	355A	539G	302A	312C	486G	486C	559G	559C
Cw*120201															
Cw*120202															
Cw*120203															
Cw*120301															
Cw*120302															
Cw*120303															
Cw*120401															
Cw*120402															
Cw*1205															
Cw*1206															
Cw*1207															
Cw*1208															
Cw*1209															
Cw*1210															
Cw*1211															
Cw*1212															
Cw*1213															
Cw*1214															
Cw*1215															
Cw*140201															
Cw*140202															
Cw*140203															
Cw*1403															
Cw*1404															
Cw*1405															
Cw*150201															
Cw*150202															
Cw*1503															
Cw*1504															
Cw*150501															
Cw*150502															
Cw*150503															
Cw*150504															
Cw*1506															
Cw*1507															
Cw*1508															
Cw*1509															
Cw*1510															
Cw*1511															
Cw*1512															

	97G	102C	103T	142G	176G	419C	419T	355A	539G	302A	312C	486G	486C	559G	559C
Cw*1601															
Cw*1602															
Cw*160401															
Cw*1606															
Cw*1701															
Cw*1702															
Cw*1703															
Cw*1801															
Cw*1802															

**Cw Common Ambiguity Chart:**

<b>C-1</b>	<b>C-2</b>	<b>C1-Pobes</b>	<b>C2-Pobes</b>
Cw*01(02,06)	Cw*04(01,09N)	Cw312C/Cw486C	Cw142G/Cw419T
Cw*0102	Cw*07(01,05,06)	Cw103T	Cw97G/Cw102C
Cw*0202	Cw*05(01,03)	Cw559G/Cw176G	
Cw*03(03,04)	Cw*0702	Cw559C/Cw486G	Cw97G
Cw*03(03,11,12)	Cw*0602	Cw559C	Cw97G/Cw539G
Cw*03(03,13)	Cw*07(02,10)	Cw559C/Cw486G	Cw97G
Cw*03(04,06)	Cw*1601	Cw355A	Cw419C
Cw*03(04,09)	Cw*05(01,03,05)	Cw559C/Cw312C	Cw302A
Cw*0303	Cw*05(01,03)	Cw312C/Cw559C	Cw102C/Cw302A
Cw*0303	Cw*07(01,06,18)	Cw142G/Cw486G	Cw97G/Cw419C
Cw*0304	Cw*04(01,09N)	Cw355A	Cw103T/Cw419T
Cw*03(04,07)	Cw*15(02,07)	Cw559C	N/A
Cw*04	Cw*05(01,02)	Cw176G	Cw102C
Cw*04(01,09N)	Cw*05(01,03)	Cw103T	Cw102C
Cw*04(01,09N)	Cw*07(01,06,18)	Cw103T/Cw142G	Cw102C/Cw97G
Cw*04(01,09N)	Cw*0702	Cw103T/Cw142G	Cw102C/Cw97G
Cw*04(01,09N)	Cw*08(02,05)	Cw176G/Cw103T	Cw102C
Cw*04(01,09N)	Cw*1202	Cw419T	Cw102C/Cw419C
Cw*04(01,09N)	Cw*1203	Cw419T	Cw102C/Cw419C
Cw*05(01,03)	Cw*07(01,06)	Cw142G/Cw302A	Cw97G/Cw486C
Cw*05(01,03)	Cw*07(01,06,18)	Cw142G/Cw302A	Cw97G/Cw486C
Cw*05(01,03)	Cw*0702	Cw142G/Cw302A	Cw97G/Cw176G
Cw*0602	Cw*07(01,06)	Cw486G/Cw539G	Cw486C
Cw*0602	Cw*07(01,06,18)	Cw486G/Cw539G	Cw486C
Cw*0602	Cw*07(04,11,12)	Cw486G/Cw539G	Cw486C
Cw*07(01,06)	Cw*0702	N/A	N/A
Cw*07(01,06)	Cw*0802	Cw97G/Cw176G	Cw142G
Cw*07(01,06)	Cw*1402	Cw102C/Cw486C	Cw103T/Cw142G
Cw*07(01,06,18)	Cw*0702	N/A	N/A
Cw*0702	Cw*17(01,02,03)	Cw97G/Cw419C	Cw142G/Cw419T
Cw*12(03,04)	Cw*15(02,07)	Cw539G	Cw355A
Cw*1202	Cw*17(01,02,03)	Cw419C/Cw539G	Cw419T/Cw559G
Cw*15(02,07)	Cw*16(01,02)	Cw355A	Cw419C

**HLA-Cw Probe Cw97G**

Product Name	Size	Product Number
HaploPrep HLA-Cw97G	25 Separations	H113.PC97G

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
TCG <u>A</u> C	97	2

**HLA-Cw Alleles Targeted:**

Cw\*0602, Cw\*0604, Cw\*0605, Cw\*0606, Cw\*0607, Cw\*0608, Cw\*0609, Cw\*0610, Cw\*0611, Cw\*070101, Cw\*070102, Cw\*070103, Cw\*07020101, Cw\*07020102, Cw\*07020103, Cw\*0703, Cw\*070401, Cw\*070402, Cw\*0705, Cw\*0706, Cw\*0707, Cw\*0708, Cw\*0709, Cw\*0710, Cw\*0711, Cw\*0712, Cw\*0713, Cw\*0714, Cw\*0715, Cw\*0716, Cw\*0717, Cw\*0718, Cw\*0719, Cw\*0720, Cw\*0721, Cw\*0722, Cw\*0723, Cw\*0724, Cw\*0725, Cw\*0727, Cw\*0728, Cw\*0729, Cw\*1801, Cw\*1802

**Non HLA-Cw Alleles captured:**

B\*0729, B\*0801, B\*0802, B\*0804, B\*0805, B\*0806, B\*0807, B\*0808N, B\*0809, B\*0810, B\*0811, B\*0812, B\*0813, B\*0814, B\*0815, B\*0816, B\*0817, B\*0818, B\*0819N, B\*0820, B\*0821, B\*3912



**HLA-Cw Probe Cw102C**

Product Name	Size	Product Number
HaploPrep HLA-Cw102C	25 Separations	H113.PC102C

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
ACCGC	102	2

**HLA-Cw Alleles Targeted:**

Cw\*020201, Cw\*020202, Cw\*020203, Cw\*020204, Cw\*020205, Cw\*0203, Cw\*0204, Cw\*0205, Cw\*0206, Cw\*0207, Cw\*0208, Cw\*0209, Cw\*030201, Cw\*030202, Cw\*030301, Cw\*030302, Cw\*030303, Cw\*030304, Cw\*030401, Cw\*030402, Cw\*030403, Cw\*0305, Cw\*0306, Cw\*0307, Cw\*0308, Cw\*0309, Cw\*0310, Cw\*0311, Cw\*0312, Cw\*0313, Cw\*0314, Cw\*0315, Cw\*0316, Cw\*0317, Cw\*0318, Cw\*0403, Cw\*0406, Cw\*0501, Cw\*050102, Cw\*0502, Cw\*0503, Cw\*0504, Cw\*0505, Cw\*0506, Cw\*0507N, Cw\*0508, Cw\*0509, Cw\*0510, Cw\*0602, Cw\*0603, Cw\*0604, Cw\*0605, Cw\*0606, Cw\*0607, Cw\*0608, Cw\*0609, Cw\*0610, Cw\*0611, Cw\*070101, Cw\*070102, Cw\*070103, Cw\*07020101, Cw\*07020102, Cw\*07020103, Cw\*0703, Cw\*070401, Cw\*070402, Cw\*0705, Cw\*0706, Cw\*0707, Cw\*0708, Cw\*0709, Cw\*0710, Cw\*0711, Cw\*0712, Cw\*0713, Cw\*0714, Cw\*0715, Cw\*0716, Cw\*0717, Cw\*0718, Cw\*0719, Cw\*0720, Cw\*0721, Cw\*0722, Cw\*0723, Cw\*0724, Cw\*0725, Cw\*0726, Cw\*0727, Cw\*0728, Cw\*0729, Cw\*080101, Cw\*080102, Cw\*0802, Cw\*0803, Cw\*0804, Cw\*0805, Cw\*0806, Cw\*0807, Cw\*0808, Cw\*0809, Cw\*0810, Cw\*0811, Cw\*0812, Cw\*120201, Cw\*120202, Cw\*120203, Cw\*120301, Cw\*120302, Cw\*120303, Cw\*120401, Cw\*120402, Cw\*1205, Cw\*1206, Cw\*1207, Cw\*1208, Cw\*1209, Cw\*1210, Cw\*1211, Cw\*1212, Cw\*1213, Cw\*1214, Cw\*1215, Cw\*150201, Cw\*150202, Cw\*1503, Cw\*1504, Cw\*150501, Cw\*150502, Cw\*150503, Cw\*150504, Cw\*1506, Cw\*1507, Cw\*1508, Cw\*1509, Cw\*1511, Cw\*1512, Cw\*1601, Cw\*1602, Cw\*160401, Cw\*1606, Cw\*1701, Cw\*1702, Cw\*1703, Cw\*1801, Cw\*1802

**Non HLA-Cw Alleles captured:**

A\*0205, A\*0206, A\*0208, A\*0210, A\*0214, A\*0221, A\*0228, A\*0241, A\*0244, A\*0251, A\*0254, A\*0257, A\*0261, A\*0312, A\*110101, A\*110102, A\*1102, A\*1103, A\*1104, A\*1105, A\*1106, A\*1107, A\*1108, A\*1109, A\*1110, A\*1111, A\*1112, A\*1113, A\*1114, A\*1115, A\*1116, A\*1117, A\*250101, A\*250102, A\*2502, A\*2504, A\*2601, A\*2602, A\*2603, A\*2604, A\*2605, A\*2606, A\*260701, A\*260702, A\*2608, A\*2609, A\*2610, A\*2611N, A\*2612, A\*2613, A\*2614, A\*2615, A\*2617, A\*2618, A\*2619, A\*3008, A\*3401, A\*3402, A\*3403, A\*3404, A\*3405, A\*4301, A\*6601, A\*6602, A\*6603, A\*6604, A\*680101, A\*680103, A\*6804, A\*6808, A\*6810, A\*6813, A\*6814, A\*6822, A\*6825, A\*6901, B\*070201, B\*070202, B\*070203, B\*070204, B\*0703, B\*0704, B\*0705, B\*0706, B\*0707, B\*0708, B\*0709, B\*0710, B\*0711, B\*0712, B\*0713, B\*0714, B\*0715, B\*0716, B\*0717, B\*0718, B\*0719, B\*0720, B\*0721, B\*0722, B\*0723, B\*0724, B\*0725, B\*0726, B\*0727, B\*0728, B\*0730, B\*0731, B\*0732, B\*0733, B\*0734, B\*0735, B\*0736, B\*1401, B\*1402, B\*1403, B\*1404, B\*1405, B\*140601, B\*140602, B\*1568, B\*1571, B\*180101, B\*180102, B\*1802, B\*1803, B\*1805, B\*1806, B\*1807, B\*1808, B\*1809, B\*1810, B\*1811, B\*1812, B\*1813, B\*1814, B\*1815, B\*1817N, B\*1818, B\*1819, B\*2701, B\*2702, B\*2703, B\*2704,

*For Research Use Only*

B\*270502, B\*270503, B\*270504, B\*270505, B\*270506, B\*2706, B\*2707, B\*2708, B\*2709, B\*2710, B\*2711, B\*2712, B\*2713, B\*2714, B\*2715, B\*2716, B\*2717, B\*2718, B\*2719, B\*2720, B\*2721, B\*2723, B\*2724, B\*2725, B\*3701, B\*3702, B\*3703N, B\*3704, B\*3705, B\*3801, B\*380201, B\*380202, B\*3803, B\*3804, B\*3805, B\*3806, B\*3807, B\*3808, B\*3809, B\*390101, B\*390103, B\*390104, B\*390201, B\*390202, B\*3903, B\*3905, B\*390601, B\*390602, B\*3908, B\*3909, B\*3910, B\*3911, B\*3912, B\*3913, B\*3914, B\*3915, B\*3916, B\*3917, B\*3918, B\*3919, B\*3920, B\*3922, B\*3923, B\*3924, B\*3925N, B\*3926, B\*3927, B\*3928, B\*4002, B\*4003, B\*4004, B\*4005, B\*40060101, B\*40060102, B\*4008, B\*4009, B\*4011, B\*4013, B\*4018, B\*4019, B\*4020, B\*4024, B\*4026, B\*4027, B\*4028, B\*4029, B\*4035, B\*4037, B\*4039, B\*4040, B\*4044, B\*4201, B\*4202, B\*4204, B\*4205, B\*4422, B\*4801, B\*4802, B\*4803, B\*4804, B\*4805, B\*4806, B\*4807, B\*4808, B\*5402, B\*5510, B\*670101, B\*670102, B\*6702, B\*7301, B\*8101, B\*8102, G\*010101, G\*010102, G\*010103, G\*010104, G\*010105, G\*010106, G\*010107, G\*010108, G\*0102, G\*0103, G\*010401, G\*010402, G\*010403, G\*0106

**HLA-Cw Probe Cw103T**

Product Name	Size	Product Number
HaploPrep HLA-Cw103T	25 Separations	H113.PC103T

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
CAT <u>C</u> C	103	2

**HLA-Cw Alleles Targeted:**

Cw\*010201, Cw\*010202, Cw\*0103, Cw\*0104, Cw\*0105, Cw\*0106, Cw\*0107, Cw\*0108, Cw\*0109, Cw\*0110, Cw\*04010101, Cw\*04010102, Cw\*040102, Cw\*040401, Cw\*040402, Cw\*0405, Cw\*0407, Cw\*0408, Cw\*0409N, Cw\*0410, Cw\*0411, Cw\*0412, Cw\*0413, Cw\*0414, Cw\*0415, Cw\*140201, Cw\*140202, Cw\*140203, Cw\*1403, Cw\*1404, Cw\*1405

**Non HLA-Cw Alleles captured:**

A\*010101, A\*010102, A\*0102, A\*0103, A\*0104N, A\*0106, A\*0107, A\*0108, A\*0109, A\*02010101, A\*02010102L, A\*020102, A\*020103, A\*020104, A\*020105, A\*020106, A\*020107, A\*020108, A\*020109, A\*0202, A\*0203, A\*0204, A\*0207, A\*0209, A\*0211, A\*0212, A\*0213, A\*0215N, A\*0216, A\*021701, A\*021702, A\*0218, A\*0219, A\*022001, A\*022002, A\*0222, A\*0224, A\*0225, A\*0226, A\*0227, A\*0229, A\*0230, A\*0231, A\*0232N, A\*0233, A\*0234, A\*0235, A\*0236, A\*0237, A\*0238, A\*0239, A\*0240, A\*0242, A\*0243N, A\*0245, A\*0246, A\*0247, A\*0248, A\*0249, A\*0250, A\*0252, A\*0253N, A\*0255, A\*0256, A\*0258, A\*0259, A\*0260, A\*0262, A\*0263, A\*0264, A\*0265, A\*0266, A\*0267, A\*03010101, A\*03010102N, A\*030102, A\*030103, A\*0302, A\*0303N, A\*0304, A\*0305, A\*0306, A\*0307, A\*0308, A\*0309, A\*0310, A\*0311N, A\*0313, A\*0314, A\*2301, A\*2302, A\*2303, A\*2304, A\*2305, A\*2306, A\*2307N, A\*2308N, A\*2309, A\*2310, A\*2311N, A\*2312, A\*24020101, A\*24020102L, A\*240202, A\*240203, A\*240204, A\*240205, A\*240301, A\*240302, A\*2404, A\*2405, A\*2406, A\*2407, A\*2408, A\*2409N, A\*2410, A\*2411N, A\*2413, A\*2414, A\*2415, A\*2417, A\*2418, A\*2419, A\*2420, A\*2421, A\*2422, A\*2423, A\*2424, A\*2425, A\*2426, A\*2427, A\*2428, A\*2429, A\*2430, A\*2431, A\*2432, A\*2433, A\*2434, A\*2435, A\*2436N, A\*2437, A\*2438, A\*2439, A\*2440N, A\*2441, A\*2503, A\*2616, A\*29010101, A\*29010102N, A\*290201, A\*290202, A\*2903, A\*2904, A\*2905, A\*2906, A\*2907, A\*2908N, A\*2909, A\*2910, A\*2911, A\*3001, A\*3002, A\*3003, A\*3004, A\*3006, A\*3007, A\*3009, A\*3010, A\*3011, A\*3012, A\*310102, A\*3102, A\*3103, A\*3104, A\*3105, A\*3106, A\*3107, A\*3108, A\*3109, A\*3201, A\*3202, A\*3203, A\*3204, A\*3205, A\*3206, A\*3207, A\*3301, A\*330301, A\*330302, A\*3304, A\*3305, A\*3306, A\*3307, A\*3601, A\*3602, A\*3603, A\*3604, A\*7401, A\*7402, A\*7403, A\*7404, A\*7405, A\*7406, A\*7407, A\*7408, A\*7409, A\*7410, A\*8001

**HLA-Cw Probe Cw142G**

Product Name	Size	Product Number
HaploPrep HLA-Cw142G	25 Separations	H113.PC142G

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
TCGCA	142	2

**HLA-Cw Alleles Targeted:**

Cw\*020201, Cw\*020202, Cw\*020203, Cw\*020204, Cw\*020205, Cw\*0203, Cw\*0204, Cw\*0205, Cw\*0206, Cw\*0207, Cw\*0208, Cw\*0209, Cw\*030201, Cw\*030202, Cw\*030301, Cw\*030302, Cw\*030303, Cw\*030304, Cw\*030401, Cw\*030402, Cw\*030403, Cw\*0305, Cw\*0306, Cw\*0307, Cw\*0308, Cw\*0309, Cw\*0310, Cw\*0312, Cw\*0313, Cw\*0314, Cw\*0315, Cw\*0316, Cw\*0317, Cw\*0318, Cw\*04010101, Cw\*04010102, Cw\*040102, Cw\*0403, Cw\*040401, Cw\*040402, Cw\*0405, Cw\*0406, Cw\*0407, Cw\*0408, Cw\*0409N, Cw\*0410, Cw\*0411, Cw\*0412, Cw\*0413, Cw\*0414, Cw\*0415, Cw\*0501, Cw\*050102, Cw\*0502, Cw\*0503, Cw\*0504, Cw\*0505, Cw\*0506, Cw\*0507N, Cw\*0508, Cw\*0509, Cw\*0510, Cw\*0720, Cw\*080101, Cw\*080102, Cw\*0802, Cw\*0803, Cw\*0804, Cw\*0805, Cw\*0806, Cw\*0807, Cw\*0808, Cw\*0809, Cw\*0810, Cw\*0811, Cw\*0812, Cw\*120201, Cw\*120202, Cw\*120203, Cw\*120301, Cw\*120302, Cw\*120303, Cw\*120401, Cw\*120402, Cw\*1205, Cw\*1206, Cw\*1207, Cw\*1208, Cw\*1209, Cw\*1210, Cw\*1211, Cw\*1212, Cw\*1213, Cw\*1214, Cw\*1215, Cw\*140201, Cw\*140202, Cw\*140203, Cw\*1403, Cw\*1404, Cw\*1405, Cw\*150201, Cw\*150202, Cw\*1503, Cw\*1504, Cw\*150501, Cw\*150502, Cw\*150503, Cw\*150504, Cw\*1506, Cw\*1507, Cw\*1508, Cw\*1509, Cw\*1510, Cw\*1511, Cw\*1512, Cw\*1601, Cw\*1602, Cw\*160401, Cw\*1606, Cw\*1701, Cw\*1702, Cw\*1703

**Non HLA-Cw Alleles captured:**

A\*010101, A\*010102, A\*0102, A\*0103, A\*0104N, A\*0106, A\*0107, A\*0108, A\*0109, A\*02010101, A\*02010102L, A\*020102, A\*020103, A\*020104, A\*020105, A\*020106, A\*020107, A\*020108, A\*020109, A\*0202, A\*0203, A\*0204, A\*0205, A\*0206, A\*0207, A\*0208, A\*0209, A\*0210, A\*0211, A\*0212, A\*0213, A\*0214, A\*0215N, A\*0216, A\*021701, A\*021702, A\*0218, A\*0219, A\*022001, A\*022002, A\*0221, A\*0222, A\*0224, A\*0225, A\*0226, A\*0227, A\*0228, A\*0229, A\*0230, A\*0231, A\*0232N, A\*0233, A\*0234, A\*0235, A\*0236, A\*0237, A\*0238, A\*0239, A\*0240, A\*0241, A\*0243N, A\*0244, A\*0245, A\*0246, A\*0247, A\*0248, A\*0249, A\*0250, A\*0251, A\*0252, A\*0253N, A\*0254, A\*0255, A\*0256, A\*0257, A\*0258, A\*0259, A\*0260, A\*0261, A\*0262, A\*0263, A\*0264, A\*0265, A\*0266, A\*0267, A\*03010101, A\*03010102N, A\*030102, A\*030103, A\*0302, A\*0303N, A\*0304, A\*0305, A\*0306, A\*0307, A\*0308, A\*0309, A\*0310, A\*0311N, A\*0312, A\*0313, A\*0314, A\*110101, A\*110102, A\*1102, A\*1103, A\*1104, A\*1105, A\*1106, A\*1107, A\*1108, A\*1109, A\*1110, A\*1111, A\*1112, A\*1113, A\*1114, A\*1115, A\*1116, A\*1117, A\*2301, A\*2302, A\*2303, A\*2304, A\*2305, A\*2306, A\*2307N, A\*2308N, A\*2309, A\*2310, A\*2311N, A\*2311N, A\*2312, A\*24020101, A\*24020102L, A\*240202, A\*240203, A\*240204, A\*240205, A\*240301, A\*240302, A\*2404, A\*2405, A\*2406, A\*2407, A\*2408, A\*2409N, A\*2410, A\*2411N, A\*2413, A\*2414, A\*2415, A\*2417, A\*2418, A\*2419, A\*2420, A\*2421, A\*2422, A\*2423, A\*2424, A\*2425, A\*2426, A\*2427, A\*2428, A\*2429, A\*2430, A\*2431, A\*2432, A\*2433, A\*2434, A\*2435, A\*2436N, A\*2437, A\*2438, A\*2439,

*For Research Use Only*

A\*2440N, A\*2441, A\*250101, A\*250102, A\*2502, A\*2503, A\*2504, A\*2601, A\*2602, A\*2603, A\*2604, A\*2605, A\*2606, A\*260701, A\*260702, A\*2608, A\*2609, A\*2610, A\*2611N, A\*2612, A\*2613, A\*2614, A\*2615, A\*2616, A\*2617, A\*2618, A\*2619, A\*29010101, A\*29010102N, A\*290201, A\*290202, A\*2903, A\*2904, A\*2905, A\*2906, A\*2907, A\*2908N, A\*2909, A\*2910, A\*2911, A\*3001, A\*3002, A\*3003, A\*3004, A\*3006, A\*3007, A\*3008, A\*3009, A\*3010, A\*3011, A\*3012, A\*310102, A\*3102, A\*3103, A\*3104, A\*3105, A\*3106, A\*3107, A\*3108, A\*3109, A\*3201, A\*3202, A\*3203, A\*3204, A\*3205, A\*3206, A\*3207, A\*3301, A\*330301, A\*330302, A\*3304, A\*3305, A\*3306, A\*3307, A\*3401, A\*3402, A\*3403, A\*3404, A\*3405, A\*3601, A\*3602, A\*3603, A\*3604, A\*4301, A\*6601, A\*6602, A\*6603, A\*6604, A\*680101, A\*680102, A\*680103, A\*6802, A\*680301, A\*680302, A\*6804, A\*6805, A\*6806, A\*6807, A\*6808, A\*6809, A\*6810, A\*6811N, A\*6812, A\*6813, A\*6814, A\*6815, A\*6816, A\*6817, A\*6818N, A\*6819, A\*6820, A\*6821, A\*6822, A\*6823, A\*6824, A\*6825, A\*6901, A\*7401, A\*7402, A\*7403, A\*7404, A\*7405, A\*7406, A\*7407, A\*7408, A\*7409, A\*7410, A\*8001, B\*15010101, B\*15010102N, B\*150102, B\*150103, B\*150104, B\*1502, B\*1504, B\*1505, B\*1506, B\*1507, B\*1508, B\*151101, B\*151102, B\*1512, B\*1513, B\*1514, B\*1515, B\*1516, B\*15170101, B\*15170102, B\*1519, B\*1520, B\*1521, B\*1524, B\*1525, B\*1526N, B\*1527, B\*1528, B\*1530, B\*1531, B\*1532, B\*1533, B\*1534, B\*1535, B\*1536, B\*1538, B\*1539, B\*1540, B\*1542, B\*1543, B\*1544, B\*1545, B\*1546, B\*1548, B\*1550, B\*1555, B\*1556, B\*1557, B\*1558, B\*1560, B\*1563, B\*1565, B\*1566, B\*1567, B\*1570, B\*1571, B\*1573, B\*1575, B\*1576, B\*1577, B\*1578, B\*1579N, B\*1581, B\*1582, B\*1583, B\*350101, B\*350102, B\*3502, B\*3503, B\*3504, B\*3505, B\*3506, B\*3507, B\*3508, B\*350901, B\*350902, B\*3510, B\*3511, B\*3512, B\*3513, B\*351401, B\*351402, B\*3515, B\*3516, B\*3517, B\*3518, B\*3519, B\*3520, B\*3521, B\*3522, B\*3523, B\*3524, B\*3526, B\*3527, B\*3528, B\*3529, B\*3530, B\*3531, B\*3532, B\*3533, B\*3534, B\*3535, B\*3536, B\*3537, B\*3538, B\*3539, B\*3540N, B\*3541, B\*3542, B\*3543, B\*3544, B\*3545, B\*3546, B\*3547, B\*3548, B\*4010, B\*4021, B\*4601, B\*4602, B\*510102, B\*510202, B\*5105, B\*5115, B\*520101, B\*520103, B\*5204, B\*5205, B\*5301, B\*5302, B\*5303, B\*5304, B\*5305, B\*5307, B\*5308, B\*5309, B\*5401, B\*5402, B\*5501, B\*5502, B\*5503, B\*5504, B\*5505, B\*5507, B\*5508, B\*5509, B\*5511, B\*5512, B\*5513, B\*5514, B\*5515, B\*5516, B\*5601, B\*5602, B\*5603, B\*5604, B\*560502, B\*5607, B\*5608, B\*5609, B\*5610, B\*5611, B\*5612, B\*570101, B\*570102, B\*5702, B\*570301, B\*570302, B\*5704, B\*5705, B\*5706, B\*5707, B\*5708, B\*5709, B\*5801, B\*5802, B\*5804, B\*5805, B\*5806, B\*5807, B\*5809, B\*5901, B\*780201, B\*7804, B\*7805, F\*010101, F\*010102, G\*010101, G\*010102, G\*010103, G\*010104, G\*010105, G\*010106, G\*010107, G\*010108, G\*0102, G\*0103, G\*010401, G\*010402, G\*010403, G\*0105N, G\*0106

**HLA-Cw Probe Cw176G**

Product Name	Size	Product Number
HaploPrep HLA-Cw176G	25 Separations	H113.PC176G

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
GCGGT	176	2

**HLA-Cw Alleles Targeted:**

Cw\*010201, Cw\*010202, Cw\*0103, Cw\*0104, Cw\*0105, Cw\*0106, Cw\*0107, Cw\*0108, Cw\*0109, Cw\*0110, Cw\*020201, Cw\*020202, Cw\*020203, Cw\*020204, Cw\*020205, Cw\*0203, Cw\*0204, Cw\*0205, Cw\*0206, Cw\*0207, Cw\*0208, Cw\*0209, Cw\*030201, Cw\*030202, Cw\*030301, Cw\*030302, Cw\*030303, Cw\*030304, Cw\*030401, Cw\*030402, Cw\*030403, Cw\*0305, Cw\*0306, Cw\*0307, Cw\*0308, Cw\*0309, Cw\*0310, Cw\*0311, Cw\*0312, Cw\*0313, Cw\*0314, Cw\*0315, Cw\*0316, Cw\*0317, Cw\*0318, Cw\*04010101, Cw\*04010102, Cw\*040102, Cw\*0403, Cw\*040401, Cw\*040402, Cw\*0405, Cw\*0406, Cw\*0407, Cw\*0408, Cw\*0409N, Cw\*0410, Cw\*0411, Cw\*0412, Cw\*0413, Cw\*0414, Cw\*0415, Cw\*0509, Cw\*0510, Cw\*0602, Cw\*0603, Cw\*0604, Cw\*0606, Cw\*0607, Cw\*0608, Cw\*0609, Cw\*0610, Cw\*0611, Cw\*070101, Cw\*070102, Cw\*070103, Cw\*07020101, Cw\*07020102, Cw\*07020103, Cw\*0703, Cw\*070401, Cw\*070402, Cw\*0705, Cw\*0706, Cw\*0707, Cw\*0708, Cw\*0709, Cw\*0710, Cw\*0711, Cw\*0712, Cw\*0713, Cw\*0714, Cw\*0715, Cw\*0716, Cw\*0717, Cw\*0718, Cw\*0719, Cw\*0720, Cw\*0721, Cw\*0722, Cw\*0723, Cw\*0724, Cw\*0725, Cw\*0726, Cw\*0727, Cw\*0728, Cw\*0729, Cw\*120201, Cw\*120202, Cw\*120203, Cw\*120301, Cw\*120302, Cw\*120303, Cw\*120401, Cw\*120402, Cw\*1205, Cw\*1206, Cw\*1207, Cw\*1208, Cw\*1209, Cw\*1210, Cw\*1211, Cw\*1212, Cw\*1213, Cw\*1214, Cw\*1215, Cw\*140201, Cw\*140202, Cw\*140203, Cw\*1403, Cw\*1404, Cw\*1405, Cw\*150201, Cw\*150202, Cw\*1503, Cw\*1504, Cw\*150501, Cw\*150502, Cw\*150503, Cw\*150504, Cw\*1506, Cw\*1507, Cw\*1508, Cw\*1509, Cw\*1510, Cw\*1511, Cw\*1512, Cw\*1601, Cw\*1602, Cw\*160401, Cw\*1606, Cw\*1701, Cw\*1702, Cw\*1703, Cw\*1801, Cw\*1802

**Non HLA-Cw Alleles captured:**

A\*010101, A\*010102, A\*0102, A\*0103, A\*0104N, A\*0106, A\*0107, A\*0108, A\*0109, A\*02010101, A\*02010102L, A\*020102, A\*020103, A\*020104, A\*020105, A\*020106, A\*020107, A\*020108, A\*020109, A\*0202, A\*0203, A\*0204, A\*0205, A\*0206, A\*0207, A\*0208, A\*0209, A\*0210, A\*0211, A\*0212, A\*0213, A\*0214, A\*0215N, A\*0216, A\*021701, A\*021702, A\*0218, A\*0219, A\*022001, A\*022002, A\*0221, A\*0222, A\*0224, A\*0225, A\*0226, A\*0227, A\*0228, A\*0229, A\*0230, A\*0231, A\*0232N, A\*0233, A\*0234, A\*0235, A\*0236, A\*0237, A\*0238, A\*0239, A\*0240, A\*0241, A\*0242, A\*0243N, A\*0244, A\*0245, A\*0246, A\*0247, A\*0248, A\*0249, A\*0250, A\*0251, A\*0252, A\*0253N, A\*0254, A\*0255, A\*0256, A\*0257, A\*0258, A\*0259, A\*0260, A\*0261, A\*0262, A\*0263, A\*0264, A\*0265, A\*0266, A\*0267, A\*03010101, A\*03010102N, A\*030102, A\*030103, A\*0302, A\*0303N, A\*0304, A\*0305, A\*0306, A\*0307, A\*0308, A\*0309, A\*0310, A\*0311N, A\*0312, A\*0313, A\*0314, A\*110101, A\*110102, A\*1102, A\*1103, A\*1104, A\*1105, A\*1106, A\*1107, A\*1108, A\*1109, A\*1110, A\*1111, A\*1112, A\*1113, A\*1114, A\*1115, A\*1116, A\*1117, A\*2301, A\*2302, A\*2303, A\*2304, A\*2305, A\*2306, A\*2307N,

*For Research Use Only*

A\*2308N, A\*2309, A\*2310, A\*2311N, A\*2312, A\*24020101, A\*24020102L, A\*240202, A\*240203, A\*240204, A\*240205, A\*240301, A\*240302, A\*2404, A\*2405, A\*2406, A\*2407, A\*2408, A\*2409N, A\*2410, A\*2411N, A\*2413, A\*2414, A\*2415, A\*2417, A\*2418, A\*2419, A\*2420, A\*2421, A\*2422, A\*2423, A\*2424, A\*2425, A\*2426, A\*2427, A\*2428, A\*2429, A\*2430, A\*2431, A\*2432, A\*2433, A\*2434, A\*2435, A\*2436N, A\*2437, A\*2438, A\*2439, A\*2440N, A\*2441, A\*250101, A\*250102, A\*2502, A\*2503, A\*2504, A\*2601, A\*2602, A\*2603, A\*2604, A\*2605, A\*2606, A\*260701, A\*260702, A\*2608, A\*2609, A\*2610, A\*2611N, A\*2612, A\*2613, A\*2614, A\*2616, A\*2617, A\*2618, A\*2619, A\*3001, A\*3002, A\*3003, A\*3004, A\*3006, A\*3007, A\*3008, A\*3009, A\*3010, A\*3011, A\*3012, A\*310102, A\*3102, A\*3103, A\*3104, A\*3105, A\*3106, A\*3107, A\*3108, A\*3109, A\*3204, A\*3301, A\*330301, A\*330302, A\*3304, A\*3305, A\*3306, A\*3307, A\*3401, A\*3402, A\*3403, A\*3404, A\*3405, A\*3601, A\*3602, A\*3603, A\*3604, A\*4301, A\*6601, A\*6602, A\*6603, A\*6604, A\*680101, A\*680102, A\*680103, A\*6802, A\*680301, A\*680302, A\*6804, A\*6805, A\*6806, A\*6807, A\*6808, A\*6809, A\*6810, A\*6811N, A\*6812, A\*6813, A\*6814, A\*6815, A\*6816, A\*6817, A\*6818N, A\*6819, A\*6820, A\*6821, A\*6822, A\*6823, A\*6824, A\*6825, A\*6901, B\*150104, B\*5401, B\*5402, F\*010101, F\*010102, G\*010101, G\*010102, G\*010103, G\*010104, G\*010105, G\*010106, G\*010107, G\*010108, G\*0102, G\*0103, G\*010401, G\*010402, G\*010403, G\*0105N, G\*0106

**HLA-Cw Probe Cw419C**

Product Name	Size	Product Number
HaploPrep HLA-Cw419C	25 Separations	H113.PC419C

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
GTCCG	419	3

**HLA-Cw Alleles Targeted:**

Cw\*0104, Cw\*020201, Cw\*020202, Cw\*020203, Cw\*020204, Cw\*020205, Cw\*0203, Cw\*0204, Cw\*0205, Cw\*0208, Cw\*0209, Cw\*030201, Cw\*030202, Cw\*0314, Cw\*0315, Cw\*0316, Cw\*0504, Cw\*0602, Cw\*0603, Cw\*0604, Cw\*0605, Cw\*0606, Cw\*0607, Cw\*0608, Cw\*0610, Cw\*0611, Cw\*070101, Cw\*070102, Cw\*070103, Cw\*07020101, Cw\*07020102, Cw\*07020103, Cw\*0703, Cw\*0705, Cw\*0706, Cw\*0707, Cw\*0708, Cw\*0709, Cw\*0710, Cw\*0714, Cw\*0715, Cw\*0716, Cw\*0717, Cw\*0718, Cw\*0719, Cw\*0720, Cw\*0721, Cw\*0722, Cw\*0723, Cw\*0724, Cw\*0725, Cw\*0726, Cw\*0727, Cw\*0809, Cw\*0811, Cw\*120201, Cw\*120202, Cw\*120203, Cw\*120301, Cw\*120302, Cw\*120303, Cw\*120401, Cw\*120402, Cw\*1205, Cw\*1206, Cw\*1207, Cw\*1208, Cw\*1209, Cw\*1210, Cw\*1211, Cw\*1212, Cw\*1213, Cw\*1214, Cw\*140201, Cw\*140202, Cw\*140203, Cw\*1403, Cw\*1404, Cw\*1405, Cw\*1504, Cw\*1509, Cw\*1601, Cw\*1602, Cw\*160401, Cw\*1606

**Non HLA-Cw Alleles captured:**

B\*0709, B\*0711, B\*0714, B\*0717, B\*1304, B\*1310, B\*15010101, B\*15010102N, B\*150102, B\*150103, B\*150104, B\*1502, B\*1503, B\*1504, B\*1505, B\*1506, B\*1507, B\*1508, B\*151101, B\*151102, B\*1512, B\*1513, B\*1514, B\*1515, B\*1516, B\*1518, B\*1519, B\*1520, B\*1521, B\*1523, B\*1524, B\*1525, B\*1526N, B\*1527, B\*1528, B\*1529, B\*1531, B\*1532, B\*1533, B\*1534, B\*1535, B\*1536, B\*1538, B\*1539, B\*1540, B\*1543, B\*1544, B\*1546, B\*1547, B\*1549, B\*1550, B\*1551, B\*1552, B\*1553, B\*1554, B\*1555, B\*1556, B\*1557, B\*1560, B\*1561, B\*1562, B\*1564, B\*1565, B\*1566, B\*1567, B\*1568, B\*1569, B\*1570, B\*1571, B\*1572, B\*1574, B\*1575, B\*1576, B\*1578, B\*1579N, B\*1580, B\*1581, B\*1582, B\*180101, B\*180102, B\*1802, B\*1803, B\*1804, B\*1805, B\*1806, B\*1807, B\*1808, B\*1809, B\*1810, B\*1811, B\*1812, B\*1813, B\*1814, B\*1815, B\*1817N, B\*1818, B\*1819, B\*2706, B\*2721, B\*350101, B\*350102, B\*3505, B\*3507, B\*3508, B\*3510, B\*3511, B\*351401, B\*351402, B\*3515, B\*3516, B\*3517, B\*3519, B\*3520, B\*3521, B\*3523, B\*3524, B\*3525, B\*3526, B\*3527, B\*3528, B\*3529, B\*3530, B\*3532, B\*3535, B\*3537, B\*3540N, B\*3541, B\*3542, B\*3543, B\*3545, B\*3546, B\*3547, B\*3548, B\*3907, B\*4003, B\*4009, B\*4020, B\*4042, B\*4405, B\*4417, B\*4425, B\*4601, B\*4602, B\*4802, B\*5301, B\*5302, B\*5303, B\*5305, B\*5306, B\*5308, B\*5309, B\*5514, B\*5603, B\*5609, B\*570101, B\*570102, B\*5706, B\*5708, B\*5801, B\*5802, B\*5804, B\*5805, B\*5806, B\*5807, B\*5809, G\*010101, G\*010102, G\*010103, G\*010104, G\*010105, G\*010106, G\*010107, G\*010108, G\*0102, G\*0103, G\*010401, G\*010402, G\*010403, G\*0105N, G\*0106



**HLA-Cw Probe Cw419T**

Product Name	Size	Product Number
HaploPrep HLA-Cw419T	25 Separations	H113.PC419T

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
GT <u>TCG</u>	419	3

**HLA-Cw Alleles Targeted:**

Cw\*0103, Cw\*0206, Cw\*0312, Cw\*04010101, Cw\*04010102, Cw\*040102, Cw\*0403, Cw\*040401, Cw\*040402, Cw\*0405, Cw\*0406, Cw\*0407, Cw\*0408, Cw\*0409N, Cw\*0410, Cw\*0411, Cw\*0412, Cw\*0413, Cw\*0414, Cw\*0415, Cw\*0501, Cw\*050102, Cw\*0502, Cw\*0503, Cw\*0505, Cw\*0506, Cw\*0507N, Cw\*0508, Cw\*0509, Cw\*0510, Cw\*0609, Cw\*070401, Cw\*070402, Cw\*0711, Cw\*0712, Cw\*0713, Cw\*0728, Cw\*080101, Cw\*080102, Cw\*0802, Cw\*0803, Cw\*0804, Cw\*0805, Cw\*0806, Cw\*0807, Cw\*0808, Cw\*0810, Cw\*0812, Cw\*150202, Cw\*1503, Cw\*150501, Cw\*150502, Cw\*150503, Cw\*150504, Cw\*1507, Cw\*1508, Cw\*1510, Cw\*1511, Cw\*1512, Cw\*1701, Cw\*1702, Cw\*1703, Cw\*1801, Cw\*1802

**Non HLA-Cw Alleles captured:**

B\*1301, B\*1302, B\*1303, B\*1306, B\*1307N, B\*1308, B\*1309, B\*1311, B\*1312, B\*1401, B\*1402, B\*1403, B\*1404, B\*1405, B\*140601, B\*140602, B\*1542, B\*1558, B\*1573, B\*3506, B\*3701, B\*3703N, B\*3704, B\*3705, B\*3801, B\*380201, B\*380202, B\*3803, B\*3804, B\*3805, B\*3806, B\*3807, B\*3808, B\*3809, B\*390101, B\*390103, B\*390104, B\*390201, B\*390202, B\*3903, B\*3904, B\*3905, B\*390601, B\*390602, B\*3908, B\*3909, B\*3910, B\*3911, B\*3912, B\*3913, B\*3916, B\*3917, B\*3918, B\*3919, B\*3920, B\*3922, B\*3923, B\*3924, B\*3925N, B\*3926, B\*3927, B\*3928, B\*4036, B\*4048, B\*4410, B\*4415, B\*4418, B\*4501, B\*4502, B\*4504, B\*4505, B\*4506, B\*4807, B\*4901, B\*4902, B\*4903, B\*5001, B\*5002, B\*5004, B\*511301, B\*511302, B\*5115, B\*5307, B\*5401, B\*5402, B\*5501, B\*5502, B\*5503, B\*5505, B\*5507, B\*5509, B\*5510, B\*5511, B\*5512, B\*5513, B\*5515, B\*5516, B\*5601, B\*5602, B\*5604, B\*5607, B\*5608, B\*5610, B\*5901, B\*670101, B\*670102, B\*6702, B\*7301, B\*8201, B\*8202

**HLA-Cw Probe Cw355A**

Product Name	Size	Product Number
HaploPrep HLA-Cw355A	25 Separations	H113.PC355A

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
TCATC	355	3

**HLA-Cw Alleles Targeted:**

Cw\*030301, Cw\*030302, Cw\*030303, Cw\*030304, Cw\*030401, Cw\*030402, Cw\*030403, Cw\*0306, Cw\*0307, Cw\*0308, Cw\*0309, Cw\*0310, Cw\*0311, Cw\*0312, Cw\*0314, Cw\*0318, Cw\*0510, Cw\*0710, Cw\*150201, Cw\*150202, Cw\*1503, Cw\*1504, Cw\*150501, Cw\*150502, Cw\*150503, Cw\*150504, Cw\*1506, Cw\*1507, Cw\*1508, Cw\*1509, Cw\*1510, Cw\*1511, Cw\*1512

**Non HLA-Cw Alleles captured:**

None

**HLA-Cw Probe Cw539G**

Product Name	Size	Product Number
HaploPrep HLA-Cw539G	25 Separations	H113.PC539G

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
GCGGA	539	3

**HLA-Cw Alleles Targeted:**

Cw\*0104, Cw\*0109, Cw\*020201, Cw\*020202, Cw\*020203, Cw\*020204, Cw\*020205, Cw\*0204, Cw\*0205, Cw\*0206, Cw\*0207, Cw\*0208, Cw\*0209, Cw\*0508, Cw\*0602, Cw\*0603, Cw\*0607, Cw\*0608, Cw\*0609, Cw\*0610, Cw\*0611, Cw\*0722, Cw\*120201, Cw\*120202, Cw\*120203, Cw\*120301, Cw\*120302, Cw\*120303, Cw\*120401, Cw\*120402, Cw\*1205, Cw\*1206, Cw\*1207, Cw\*1208, Cw\*1210, Cw\*1211, Cw\*1212, Cw\*1213, Cw\*1215, Cw\*160401

**Non HLA-Cw Alleles captured:**

None

**HLA-Cw Probe Cw302A**

Product Name	Size	Product Number
HaploPrep HLA-Cw302A	25 Separations	H113.PC302A

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
GA <u>A</u> CC	302	2

**HLA-Cw Alleles Targeted:**

Cw\*020201, Cw\*020202, Cw\*020203, Cw\*020204, Cw\*020205, Cw\*0203, Cw\*0204, Cw\*0205, Cw\*0206, Cw\*0207, Cw\*0208, Cw\*0209, Cw\*0307, Cw\*0315, Cw\*04010101, Cw\*040102, Cw\*0403, Cw\*040401, Cw\*040402, Cw\*0405, Cw\*0406, Cw\*0407, Cw\*0408, Cw\*0409N, Cw\*0410, Cw\*0411, Cw\*0412, Cw\*0413, Cw\*0414, Cw\*0415, Cw\*0501, Cw\*050102, Cw\*0502, Cw\*0503, Cw\*0504, Cw\*0505, Cw\*0506, Cw\*0507N, Cw\*0508, Cw\*0509, Cw\*0510, Cw\*0602, Cw\*0603, Cw\*0604, Cw\*0605, Cw\*0606, Cw\*0607, Cw\*0608, Cw\*0609, Cw\*0610, Cw\*0707, Cw\*0709, Cw\*0810, Cw\*120401, Cw\*120402, Cw\*1205, Cw\*1209, Cw\*1404, Cw\*150201, Cw\*150202, Cw\*1503, Cw\*1504, Cw\*150501, Cw\*150502, Cw\*150503, Cw\*150504, Cw\*1506, Cw\*1508, Cw\*1509, Cw\*1510, Cw\*1511, Cw\*1512, Cw\*1602, Cw\*1701, Cw\*1702, Cw\*1703, Cw\*1801, Cw\*1802

**Non HLA-Cw Alleles captured:**

A\*010102, A\*010103, A\*0102, A\*0103, A\*0104N, A\*0106, A\*0107, A\*0108, A\*0109, A\*0110, A\*1117, A\*2404, A\*2601, A\*2602, A\*2604, A\*2605, A\*260701, A\*260702, A\*2608, A\*2609, A\*2610, A\*2611N, A\*2612, A\*2613, A\*2614, A\*2615, A\*2616, A\*2617, A\*2618, A\*2619, A\*2620, A\*2622, A\*2623, A\*29010101, A\*29010102N, A\*290201, A\*290202, A\*290203, A\*2903, A\*2904, A\*2905, A\*2906, A\*2907, A\*2908N, A\*2909, A\*2910, A\*2911, A\*300201, A\*300202, A\*3003, A\*3004, A\*3006, A\*3007, A\*3009, A\*3010, A\*3012, A\*3601, A\*3602, A\*3603, A\*3604, A\*4301, A\*7410, A\*8001, B\*0711, B\*0806, B\*0817, B\*1557, B\*3527, B\*3556, B\*3920, B\*4037, B\*5512, , E\*0101, E\*010301

**HLA-Cw Probe Cw312C**

Product Name	Size	Product Number
HaploPrep HLA-Cw312C	25 Separations	H113.PC312C

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
AAC <u>CT</u>	312	2

**HLA-Cw Alleles Targeted:**

Cw\*010201, Cw\*010202, Cw\*0103, Cw\*0104, Cw\*0105, Cw\*0106, Cw\*0107, Cw\*0108, Cw\*0109, Cw\*0110, Cw\*030201, Cw\*030202, Cw\*030301, Cw\*030302, Cw\*030303, Cw\*030304, Cw\*030401, Cw\*030402, Cw\*030403, Cw\*0305, Cw\*0306, Cw\*0308, Cw\*0309, Cw\*0310, Cw\*0311, Cw\*0312, Cw\*0313, Cw\*0314, Cw\*0316, Cw\*0317, Cw\*0318, Cw\*0411, Cw\*0611, Cw\*070101, Cw\*070102, Cw\*070103, Cw\*07020101, Cw\*07020102, Cw\*07020103, Cw\*0703, Cw\*070401, Cw\*070402, Cw\*0705, Cw\*0706, Cw\*0708, Cw\*0710, Cw\*0711, Cw\*0712, Cw\*0713, Cw\*0714, Cw\*0715, Cw\*0716, Cw\*0717, Cw\*0718, Cw\*0719, Cw\*0720, Cw\*0721, Cw\*0722, Cw\*0723, Cw\*0724, Cw\*0725, Cw\*0726, Cw\*0727, Cw\*0728, Cw\*0729, Cw\*080101, Cw\*080102, Cw\*0802, Cw\*0803, Cw\*0804, Cw\*0805, Cw\*0806, Cw\*0807, Cw\*0808, Cw\*0809, Cw\*0811, Cw\*0812, Cw\*120201, Cw\*120202, Cw\*120203, Cw\*120301, Cw\*120302, Cw\*120303, Cw\*1206, Cw\*1207, Cw\*1208, Cw\*1210, Cw\*1211, Cw\*1212, Cw\*1213, Cw\*1214, Cw\*1215, Cw\*140201, Cw\*140202, Cw\*140203, Cw\*1403, Cw\*1404, Cw\*1405, Cw\*1507, Cw\*1601, Cw\*160401, Cw\*1606

**Non HLA-Cw Alleles captured:**

F\*010101, F\*010102, B\*070201, B\*070202, B\*070203, B\*070204, B\*0703, B\*0704, B\*0705, B\*0706, B\*0707, B\*0708, B\*0709, B\*0710, B\*0711, B\*0712, B\*0713, B\*0714, B\*0715, B\*0716, B\*0717, B\*0718, B\*0719, B\*0720, B\*0721, B\*0722, B\*0723, B\*0724, B\*0725, B\*0726, B\*0728, B\*0729, B\*0730, B\*0731, B\*0732, B\*0733, B\*0734, B\*0735, B\*0737, B\*0801, B\*0804, B\*0805, B\*0806, B\*0807, B\*0808N, B\*0809, B\*0810, B\*0811, B\*0812, B\*0813, B\*0814, B\*0815, B\*0816, B\*0817, B\*0818, B\*0819N, B\*0820, B\*0821, B\*0822, B\*1309, B\*1401, B\*1402, B\*1403, B\*1404, B\*1405, B\*140601, B\*140602, B\*15010101, B\*150102, B\*150103, B\*150104, B\*150105, B\*1502, B\*1503, B\*1504, B\*1505, B\*1506, B\*1507, B\*1508, B\*1509, B\*1510, B\*151101, B\*151102, B\*1512, B\*1514, B\*1515, B\*1518, B\*1519, B\*1520, B\*1521, B\*1525, B\*1526N, B\*1527, B\*1528, B\*1529, B\*1530, B\*1531, B\*1532, B\*1533, B\*1534, B\*1535, B\*1537, B\*1538, B\*1539, B\*1540, B\*1542, B\*1544, B\*1545, B\*1546, B\*1547, B\*1548, B\*1549, B\*1550, B\*1551, B\*1552, B\*1553, B\*1554, B\*1555, B\*1556, B\*1557, B\*1558, B\*1560, B\*1561, B\*1562, B\*1563, B\*1564, B\*1565, B\*1566, B\*1568, B\*1569, B\*1570, B\*1571, B\*1572, B\*1573, B\*1574, B\*1575, B\*1576, B\*1577, B\*1578, B\*1579N, B\*1580, B\*1581, B\*1582, B\*1583, B\*1584, B\*1585, B\*1586, B\*1588, B\*1590, B\*1591, B\*1592, B\*1593, B\*1594N, B\*1596, B\*180101, B\*180102, B\*1802, B\*1803, B\*1804, B\*1805, B\*1806, B\*1807, B\*1808, B\*1810, B\*1811, B\*1812, B\*1813, B\*1814, B\*1815, B\*1817N, B\*1818, B\*1819, B\*1820, B\*2708, B\*2712, B\*2718, B\*2726, B\*350101, B\*350102, B\*3502, B\*3503, B\*3504, B\*3505, B\*3506, B\*3507, B\*3508, B\*350901, B\*350902, B\*3510, B\*3511, B\*3512, B\*3513, B\*351401, B\*351402, B\*3515, B\*3516, B\*3517, B\*3518, B\*3519, B\*3520, B\*3521, B\*3522, B\*3523, B\*3524, B\*3525, B\*3526, B\*3527, B\*3528, B\*3529, B\*3530,

*For Research Use Only*

B\*3531, B\*3532, B\*3533, B\*3534, B\*3535, B\*3536, B\*3537, B\*3538, B\*3539, B\*3540N, B\*3541, B\*3542, B\*3543, B\*3544, B\*3545, B\*3546, B\*3547, B\*3548, B\*3549, B\*3550, B\*3551, B\*3552, B\*3553N, B\*3554, B\*3555, B\*3556, B\*390101, B\*390103, B\*390104, B\*390201, B\*390202, B\*3903, B\*3904, B\*3905, B\*390601, B\*390602, B\*3907, B\*3908, B\*3909, B\*3910, B\*3911, B\*3912, B\*3913, B\*3914, B\*3915, B\*3916, B\*3917, B\*3918, B\*3919, B\*3920, B\*3922, B\*3923, B\*3924, B\*3925N, B\*3926, B\*3927, B\*3928, B\*3929, B\*3930, B\*3931, B\*3932, B\*400101, B\*400102, B\*400103, B\*400104, B\*400105, B\*400201, B\*400202, B\*4003, B\*4004, B\*4005, B\*40060101, B\*4007, B\*4008, B\*4009, B\*4010, B\*4011, B\*4012, B\*401401, B\*401402, B\*401403, B\*4015, B\*4016, B\*4018, B\*4020, B\*4021, B\*4022N, B\*4023, B\*4024, B\*4025, B\*4026, B\*4027, B\*4028, B\*4029, B\*4030, B\*4031, B\*4032, B\*4033, B\*4034, B\*4035, B\*4036, B\*4037, B\*4038, B\*4039, B\*4040, B\*4042, B\*4043, B\*4044, B\*4045, B\*4046, B\*4048, B\*4049, B\*4050, B\*4051, B\*4052, B\*4053, B\*4054, B\*4055, B\*4056, B\*4057, B\*4101, B\*4102, B\*4103, B\*4104, B\*4106, B\*4201, B\*4202, B\*4204, B\*420501, B\*420502, B\*4206, B\*4409, B\*4501, B\*4502, B\*4503, B\*4504, B\*4505, B\*4506, B\*4507, B\*4601, B\*4602, B\*4603, B\*4604, B\*4702, B\*4703, B\*4801, B\*4802, B\*4803, B\*4804, B\*4805, B\*4806, B\*4807, B\*4808, B\*4809, B\*4810, B\*5001, B\*5002, B\*5004, B\*5401, B\*5402, B\*5403, B\*5501, B\*5502, B\*5503, B\*5504, B\*5505, B\*5507, B\*5508, B\*5509, B\*5510, B\*5511, B\*5512, B\*5513, B\*5514, B\*5515, B\*5516, B\*5601, B\*5602, B\*5603, B\*5604, B\*560501, B\*560502, B\*5606, B\*5608, B\*5609, B\*5610, B\*5611, B\*5612, B\*5613, B\*5614, B\*670101, B\*670102, B\*6702, B\*7301, B\*7801, B\*780201, B\*780202, B\*7803, B\*7804, B\*7805, B\*8101, B\*8102, B\*8201, B\*8202, B\*8301

**HLA-Cw Probe 486G**

Product Name	Size	Product Number
HaploPrep HLA-Cw486G	25 Separations	H113.PC486G

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
ACG <u>G</u> C	486	3

**HLA-Cw Alleles Targeted:**

Cw\*0104, Cw\*020204, Cw\*020205, Cw\*0205, Cw\*0206, Cw\*030201, Cw\*030202, Cw\*030301, Cw\*030302, Cw\*030303, Cw\*030304, Cw\*030401, Cw\*030402, Cw\*030403, Cw\*0305, Cw\*0306, Cw\*0307, Cw\*0308, Cw\*0309, Cw\*0310, Cw\*0311, Cw\*0312, Cw\*0313, Cw\*0315, Cw\*0316, Cw\*0317, Cw\*0318, Cw\*04010101, Cw\*040102, Cw\*0403, Cw\*040401, Cw\*040402, Cw\*0405, Cw\*0406, Cw\*0407, Cw\*0408, Cw\*0409N, Cw\*0410, Cw\*0411, Cw\*0412, Cw\*0413, Cw\*0414, Cw\*0415, Cw\*0501, Cw\*0602, Cw\*0603, Cw\*0604, Cw\*0605, Cw\*0606, Cw\*0607, Cw\*0608, Cw\*0609, Cw\*0610, Cw\*0611, Cw\*080101, Cw\*080102, Cw\*0803, Cw\*0806, Cw\*0808, Cw\*0809, Cw\*0810, Cw\*0811, Cw\*120201, Cw\*120202, Cw\*120203, Cw\*120301, Cw\*120302, Cw\*120303, Cw\*120401, Cw\*120402, Cw\*1205, Cw\*1206, Cw\*1207, Cw\*1208, Cw\*1209, Cw\*1210, Cw\*1211, Cw\*1212, Cw\*1213, Cw\*1214, Cw\*1215, Cw\*140201, Cw\*140202, Cw\*140203, Cw\*1403, Cw\*1404, Cw\*1405, Cw\*150201, Cw\*150202, Cw\*1503, Cw\*1504, Cw\*150501, Cw\*150502, Cw\*150503, Cw\*150504, Cw\*1506, Cw\*1507, Cw\*1508, Cw\*1509, Cw\*1510, Cw\*1511, Cw\*1512, Cw\*1601Cw\*1602, Cw\*160401, Cw\*1606, Cw\*1701, Cw\*1702, Cw\*1703, Cw\*1801, Cw\*1802

**Non HLA-Cw Alleles captured:**

G\*010101, G\*010102, G\*010103, G\*010104, G\*010105, G\*010106, G\*010107, G\*010108, G\*0102, G\*0103, G\*010401, G\*010402, G\*010403, G\*0105N, G\*0106, A\*0218, B\*070201, B\*070202, B\*070203, B\*070204, B\*0703, B\*0704, B\*0705, B\*0706, B\*0707, B\*0708, B\*0709, B\*0710, B\*0711, B\*0712, B\*0713, B\*0714, B\*0715, B\*0716, B\*0717, B\*0718, B\*0719, B\*0720, B\*0721, B\*0722, B\*0723, B\*0724, B\*0725, B\*0726, B\*0727, B\*0728, B\*0729, B\*0730, B\*0731, B\*0732, B\*0733, B\*0734, B\*0735, B\*0736, B\*0737, B\*0738, B\*1304, B\*15010101, B\*150102, B\*150103, B\*150104, B\*150105, B\*1502, B\*1503, B\*1504, B\*1505, B\*1506, B\*1507, B\*1508, B\*1509, B\*1510, B\*151101, B\*151102, B\*1512, B\*1513, B\*1514, B\*1515, B\*1516, B\*15170101, B\*1518, B\*1519, B\*1521, B\*1523, B\*1524, B\*1525, B\*1526N, B\*1527, B\*1528, B\*1529, B\*1530, B\*1531, B\*1532, B\*1533, B\*1534, B\*1535, B\*1536, B\*1537, B\*1538, B\*1539, B\*1540, B\*1543, B\*1544, B\*1545, B\*1546, B\*1547, B\*1549, B\*1550, B\*1551, B\*1552, B\*1553, B\*1554, B\*1555, B\*1556, B\*1557, B\*1558, B\*1560, B\*1561, B\*1562, B\*1563, B\*1564, B\*1565, B\*1566, B\*1567, B\*1568, B\*1569, B\*1570, B\*1571, B\*1572, B\*1573, B\*1574, B\*1575, B\*1576, B\*1577, B\*1578, B\*1579N, B\*1580, B\*1581, B\*1582, B\*1583, B\*1584, B\*1585, B\*1587, B\*1588, B\*1589, B\*1590, B\*1591, B\*1592, B\*1593, B\*1594N, B\*1595, B\*1596, B\*2701, B\*2702, B\*2703, B\*2704, B\*270502, B\*270503, B\*270504, B\*270505, B\*270506, B\*270507, B\*2706, B\*2707, B\*2708, B\*2709, B\*2710, B\*2711, B\*2712, B\*2713, B\*2714, B\*2715, B\*2716, B\*2717, B\*2718, B\*2719, B\*2720, B\*2721, B\*2723,

*For Research Use Only*

B\*2724, B\*2725, B\*2726, B\*2727, B\*350902, B\*351402, B\*3518, B\*3531, B\*3543, B\*3544, B\*3702, B\*3707, B\*3918, B\*400101, B\*400102, B\*400103, B\*400104, B\*400105, B\*400201, B\*400202, B\*4003, B\*4004, B\*4005, B\*40060101, B\*4007, B\*4008, B\*4009, B\*4010, B\*4011, B\*4012, B\*4013, B\*401402, B\*401403, B\*4015, B\*4016, B\*4018, B\*4019, B\*4020, B\*4021, B\*4022N, B\*4023, B\*4024, B\*4025, B\*4026, B\*4027, B\*4029, B\*4030, B\*4031, B\*4032, B\*4033, B\*4034, B\*4035, B\*4036, B\*4037, B\*4038, B\*4039, B\*4040, B\*4042, B\*4043, B\*4044, B\*4045, B\*4046, B\*4047, B\*4048, B\*4049, B\*4050, B\*4051, B\*4052, B\*4053, B\*4054, B\*4055, B\*4056, B\*4057, B\*4431, B\*4601, B\*4602, B\*4603, B\*4604, B\*47010101, B\*4702, B\*4703, B\*4704, B\*4705, B\*4801, B\*4803, B\*4804, B\*4805, B\*4806, B\*4807, B\*4808, B\*4809, B\*4810, B\*5110, B\*5603, B\*570101, B\*570102, B\*5702, B\*570301, B\*5704, B\*5705, B\*5706, B\*5707, B\*5708, B\*5709, B\*7301, B\*8101, B\*8102



**HLA-Cw Probe 486C**

Product Name	Size	Product Number
HaploPrep HLA-Cw486C	25 Separations	H113.PC486C

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
ACCGC	486	3

**HLA-Cw Alleles Targeted:**

Cw\*010201, Cw\*010202, Cw\*0103, Cw\*0105, Cw\*0106, Cw\*0107, Cw\*0108, Cw\*0109, Cw\*0110, Cw\*0314, Cw\*070101, Cw\*070102, Cw\*070103, Cw\*07020101, Cw\*0703, Cw\*070401, Cw\*070402, Cw\*0705, Cw\*0706, Cw\*0707, Cw\*0708, Cw\*0709, Cw\*0710, Cw\*0711, Cw\*0712, Cw\*0713, Cw\*0714, Cw\*0715, Cw\*0716, Cw\*0717, Cw\*0718, Cw\*0719, Cw\*0720, Cw\*0721, Cw\*0722, Cw\*0723, Cw\*0724, Cw\*0725, Cw\*0726, Cw\*0727, Cw\*0728, Cw\*0729, Cw\*1214

**Non HLA-Cw Alleles captured:**

F\*010101, F\*010102, B\*0801, B\*0802, B\*0803, B\*0804, B\*0805, B\*0806, B\*0807, B\*0809, B\*0810, B\*0811, B\*0812, B\*0813, B\*0814, B\*0815, B\*0816, B\*0817, B\*0818, B\*0819N, B\*0820, B\*0821, B\*0822, B\*1301, B\*1302, B\*1303, B\*1306, B\*1307N, B\*1308, B\*1309, B\*1310, B\*1311, B\*1312, B\*1313, B\*1401, B\*1402, B\*1403, B\*1404, B\*1405, B\*140601, B\*140602, B\*1520, B\*1542, B\*1548, B\*1586, B\*180101, B\*180102, B\*1802, B\*1803, B\*1804, B\*1805, B\*1806, B\*1807, B\*1808, B\*1809, B\*1810, B\*1811, B\*1812, B\*1813, B\*1814, B\*1815, B\*1817N, B\*1818, B\*1819, B\*1820, B\*350101, B\*350102, B\*3502, B\*3503, B\*3504, B\*3505, B\*3506, B\*3507, B\*3508, B\*350901, B\*3510, B\*3511, B\*3512, B\*3513, B\*351401, B\*3515, B\*3516, B\*3517, B\*3519, B\*3520, B\*3521, B\*3522, B\*3523, B\*3524, B\*3525, B\*3526, B\*3527, B\*3528, B\*3529, B\*3530, B\*3532, B\*3533, B\*3534, B\*3535, B\*3536, B\*3537, B\*3538, B\*3539, B\*3540N, B\*3541, B\*3542, B\*3545, B\*3546, B\*3547, B\*3548, B\*3549, B\*3550, B\*3551, B\*3552, B\*3554, B\*3555, B\*3556, B\*3701, B\*3703N, B\*3704, B\*3705, B\*3706, B\*3708, B\*3801, B\*380201, B\*380202, B\*3803, B\*3804, B\*3805, B\*3806, B\*3807, B\*3808, B\*3810, B\*390101, B\*390103, B\*390104, B\*390201, B\*390202, B\*3903, B\*3904, B\*3905, B\*390601, B\*390602, B\*3907, B\*3908, B\*3909, B\*3910, B\*3911, B\*3912, B\*3913, B\*3914, B\*3915, B\*3916, B\*3917, B\*3919, B\*3920, B\*3922, B\*3923, B\*3924, B\*3925N, B\*3926, B\*3927, B\*3928, B\*3929, B\*3930, B\*3931, B\*3932, B\*401401, B\*4028, B\*4101, B\*4102, B\*4103, B\*4104, B\*4105, B\*4106, B\*4201, B\*4202, B\*4204, B\*420501, B\*420502, B\*4206, B\*44020101, B\*440202, B\*440203, B\*440301, B\*440302, B\*4404, B\*4405, B\*4406, B\*4407, B\*4408, B\*4409, B\*4410, B\*4411, B\*4412, B\*4413, B\*4414, B\*4415, B\*4416, B\*4417, B\*4418, B\*4419N, B\*4420, B\*4421, B\*4422, B\*4423N, B\*4424, B\*4425, B\*4426, B\*4427, B\*4428, B\*4429, B\*4430, B\*4432, B\*4433, B\*4434, B\*4435, B\*4436, B\*4437, B\*4438, B\*4439, B\*4440, B\*4501, B\*4502, B\*4503, B\*4504, B\*4505, B\*4506, B\*4507, B\*4802, B\*4901, B\*4902, B\*4903, B\*5001, B\*5002, B\*5004, B\*510101, B\*510102, B\*510103, B\*510104, B\*510105, B\*510201, B\*510202, B\*5103, B\*5104, B\*5105, B\*5106, B\*5107, B\*5108, B\*5109, B\*5111N, B\*5112, B\*511301, B\*511302, B\*5114, B\*5115, B\*5116, B\*5117, B\*5118, B\*5119, B\*5120, B\*5121, B\*5122, B\*5123, B\*5124, B\*5126, B\*5127N, B\*5128, B\*5129, B\*5130, B\*5131, B\*5132, B\*5133,

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B\*5134, B\*5135, B\*5136, B\*5137, B\*520101, B\*520102, B\*520103, B\*520104, B\*5202, B\*5203, B\*5204, B\*5205, B\*5206, B\*530101, B\*530102, B\*5302, B\*5303, B\*5304, B\*5305, B\*5306, B\*5307, B\*5308, B\*5309, B\*5401, B\*5402, B\*5403, B\*5501, B\*5502, B\*5503, B\*5504, B\*5505, B\*5507, B\*5508, B\*5509, B\*5510, B\*5511, B\*5512, B\*5513, B\*5514, B\*5515, B\*5516, B\*5601, B\*5602, B\*5604, B\*560501, B\*560502, B\*5606, B\*5607, B\*5608, B\*5609, B\*5610, B\*5611, B\*5612, B\*5613, B\*5614, B\*5801, B\*5802, B\*5804, B\*5805, B\*5806, B\*5807, B\*5808, B\*5809, B\*5810N, B\*5901, B\*670101, B\*670102, B\*6702, B\*7801, B\*780201, B\*780202, B\*7803, B\*7804, B\*7805, B\*8201, B\*8202, B\*8301

**HLA-Cw Probe 559G**

Product Name	Size	Product Number
HaploPrep HLA-Cw559G	25 Separations	H113.PC559G

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
GCGAG	559	3

**HLA-Cw Alleles Targeted:**

Cw\*0110, Cw\*020201, Cw\*020202, Cw\*020203, Cw\*020204, Cw\*020205, Cw\*0203, Cw\*0204, Cw\*0205, Cw\*0206, Cw\*0207, Cw\*0208, Cw\*0209, Cw\*0608, Cw\*0715, Cw\*1701, Cw\*1702, Cw\*1703

**Non HLA-Cw Alleles captured:**

F\*010101, F\*010102, A\*0216, A\*2448N, A\*6602, A\*6603, A\*8001, B\*070201, B\*070202, B\*070203, B\*070204, B\*0703, B\*0704, B\*0705, B\*0706, B\*0707, B\*0708, B\*0709, B\*0710, B\*0711, B\*0712, B\*0713, B\*0714, B\*0715, B\*0716, B\*0717, B\*0718, B\*0721, B\*0722, B\*0723, B\*0725, B\*0726, B\*0727, B\*0728, B\*0729, B\*0730, B\*0732, B\*0733, B\*0735, B\*0736, B\*0737, B\*0738, B\*1301, B\*1302, B\*1307N, B\*1308, B\*1309, B\*1310, B\*1311, B\*1312, B\*1313, B\*1540, B\*1547, B\*1549, B\*1552, B\*1810, B\*2701, B\*2702, B\*2703, B\*2704, B\*270502, B\*270503, B\*270504, B\*270505, B\*270506, B\*270507, B\*2706, B\*2707, B\*2708, B\*2709, B\*2710, B\*2711, B\*2712, B\*2713, B\*2714, B\*2716, B\*2717, B\*2718, B\*2719, B\*2720, B\*2721, B\*2723, B\*2724, B\*2726, B\*2727, B\*3515, B\*3531, B\*3533, B\*3702, B\*3707, B\*400101, B\*400102, B\*400103, B\*400104, B\*400105, B\*400201, B\*400202, B\*4003, B\*4004, B\*40060101, B\*4007, B\*4008, B\*4009, B\*4010, B\*4011, B\*4012, B\*4013, B\*401401, B\*401402, B\*401403, B\*4015, B\*4016, B\*4018, B\*4019, B\*4020, B\*4021, B\*4022N, B\*4023, B\*4024, B\*4025, B\*4027, B\*4029, B\*4030, B\*4031, B\*4032, B\*4033, B\*4034, B\*4035, B\*4036, B\*4037, B\*4038, B\*4040, B\*4042, B\*4043, B\*4044, B\*4045, B\*4046, B\*4047, B\*4048, B\*4049, B\*4050, B\*4052, B\*4053, B\*4054, B\*4055, B\*4056, B\*4057, B\*4416, B\*4421, B\*4431, B\*47010101, B\*4702, B\*4703, B\*4704, B\*4705, B\*4801, B\*4803, B\*4804, B\*4805, B\*4806, B\*4807, B\*4808, B\*4809, B\*4810, B\*5110, B\*5116, B\*5131, B\*5134, B\*5509, B\*7301, B\*8101, B\*8102

**HLA-Cw Probe 559C**

Product Name	Size	Product Number
HaploPrep HLA-Cw559C	25 Separations	H113.PC559C

**Probe target sequence** (unique sequence element, center nucleotide position & exon):

USE	center nt pos	exon
GCCTG	559	3

**HLA-Cw Alleles Targeted:**

Cw\*030201, Cw\*030202, Cw\*030301, Cw\*030302, Cw\*030303, Cw\*030304,  
Cw\*030401, Cw\*030402, Cw\*030403, Cw\*0305, Cw\*0306, Cw\*0307, Cw\*0308,  
Cw\*0309, Cw\*0310, Cw\*0311, Cw\*0312, Cw\*0313, Cw\*0315, Cw\*0317, Cw\*0318,  
Cw\*0408

**Non HLA-Cw Alleles captured:**

A\*0238, A\*110101, A\*110102, A\*110103, A\*110104, A\*1102, A\*1103, A\*1105, A\*1106,  
A\*1107, A\*1108, A\*1109, A\*1110, A\*1111, A\*1112, A\*1113, A\*1114, A\*1116, A\*1117,  
A\*1118, A\*1119, A\*1120, A\*1121N, A\*2410, A\*2448N, A\*250101, A\*250102, A\*2502,  
A\*2503, A\*2504, A\*2601, A\*2602, A\*2603, A\*2604, A\*2605, A\*2606, A\*260701,  
A\*260702, A\*2608, A\*2610, A\*2611N, A\*2612, A\*2613, A\*2614, A\*2615, A\*2616,  
A\*2617, A\*2618, A\*2619, A\*2620, A\*2621, A\*2622, A\*2623, A\*3604, A\*4301, A\*6601,  
A\*6604, B\*0720, B\*0724, B\*0821, B\*1303, B\*1304, B\*15010101, B\*150102, B\*150103,  
B\*150104, B\*150105, B\*1502, B\*1503, B\*1504, B\*1505, B\*1506, B\*1507, B\*1508,  
B\*1509, B\*1510, B\*151101, B\*151102, B\*1512, B\*1513, B\*1514, B\*1515, B\*1516,  
B\*15170101, B\*1518, B\*1519, B\*1520, B\*1521, B\*1523, B\*1524, B\*1525, B\*1526N,  
B\*1527, B\*1528, B\*1529, B\*1530, B\*1531, B\*1532, B\*1533, B\*1534, B\*1535, B\*1536,  
B\*1537, B\*1538, B\*1539, B\*1543, B\*1545, B\*1546, B\*1548, B\*1551, B\*1553, B\*1554,  
B\*1555, B\*1556, B\*1557, B\*1558, B\*1560, B\*1561, B\*1562, B\*1563, B\*1564, B\*1565,  
B\*1566, B\*1567, B\*1568, B\*1570, B\*1571, B\*1572, B\*1573, B\*1574, B\*1575, B\*1576,  
B\*1577, B\*1578, B\*1579N, B\*1580, B\*1581, B\*1582, B\*1584, B\*1585, B\*1587, B\*1588,  
B\*1589, B\*1590, B\*1591, B\*1592, B\*1594N, B\*1595, B\*1596, B\*2725, B\*350101,  
B\*350102, B\*3502, B\*3503, B\*3504, B\*3505, B\*3506, B\*3507, B\*3508, B\*350901,  
B\*350902, B\*3510, B\*3511, B\*3512, B\*3513, B\*351401, B\*351402, B\*3516, B\*3517,  
B\*3518, B\*3519, B\*3520, B\*3521, B\*3522, B\*3523, B\*3524, B\*3525, B\*3526, B\*3527,  
B\*3528, B\*3529, B\*3530, B\*3532, B\*3534, B\*3536, B\*3537, B\*3538, B\*3539, B\*3540N,  
B\*3541, B\*3542, B\*3543, B\*3544, B\*3545, B\*3546, B\*3547, B\*3548, B\*3549, B\*3550,  
B\*3551, B\*3552, B\*3553N, B\*3554, B\*3555, B\*3556, B\*3932, B\*4005, B\*4026, B\*4028,  
B\*44020101, B\*440202, B\*440203, B\*440301, B\*440302, B\*4405, B\*4406, B\*4407,  
B\*4408, B\*4409, B\*4410, B\*4411, B\*4412, B\*4413, B\*4414, B\*4415, B\*4417, B\*4418,  
B\*4419N, B\*4420, B\*4422, B\*4423N, B\*4424, B\*4425, B\*4426, B\*4427, B\*4428,  
B\*4429, B\*4430, B\*4432, B\*4433, B\*4434, B\*4435, B\*4436, B\*4437, B\*4438, B\*4439,  
B\*4440, B\*4501, B\*4502, B\*4503, B\*4504, B\*4505, B\*4506, B\*4507, B\*4601, B\*4602,  
B\*4604, B\*4802, B\*4901, B\*4902, B\*4903, B\*5001, B\*5002, B\*5004, B\*510101,  
B\*510102, B\*510103, B\*510104, B\*510105, B\*510201, B\*510202, B\*5103, B\*5104,  
B\*5105, B\*5106, B\*5107, B\*5108, B\*5109, B\*5111N, B\*5112, B\*511301, B\*511302,  
B\*5114, B\*5115, B\*5117, B\*5118, B\*5119, B\*5120, B\*5122, B\*5123, B\*5124, B\*5126,

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B\*5127N, B\*5128, B\*5129, B\*5130, B\*5132, B\*5133, B\*5135, B\*5137, B\*520101, B\*520102, B\*520103, B\*520104, B\*5202, B\*5203, B\*5204, B\*5205, B\*5206, B\*530101, B\*530102, B\*5302, B\*5303, B\*5304, B\*5305, B\*5306, B\*5307, B\*5308, B\*5309, B\*5403, B\*5508, B\*5601, B\*5602, B\*5603, B\*5604, B\*560501, B\*560502, B\*5606, B\*5607, B\*5608, B\*5609, B\*5611, B\*5613, B\*5614, B\*570101, B\*570102, B\*5702, B\*570301, B\*570302, B\*5704, B\*5705, B\*5706, B\*5707, B\*5708, B\*5709, B\*5801, B\*5802, B\*5804, B\*5806, B\*5807, B\*5808, B\*5809, B\*5810N, B\*7801, B\*780201, B\*780202, B\*7803, B\*7804, B\*7805, B\*8201, B\*8202, B\*8301