

HaploPrep™ Probe Book for HLA-DQB1



Version 1.2 (161007)
SAP # 1050347

For Research Use Only

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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-DQB1 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.

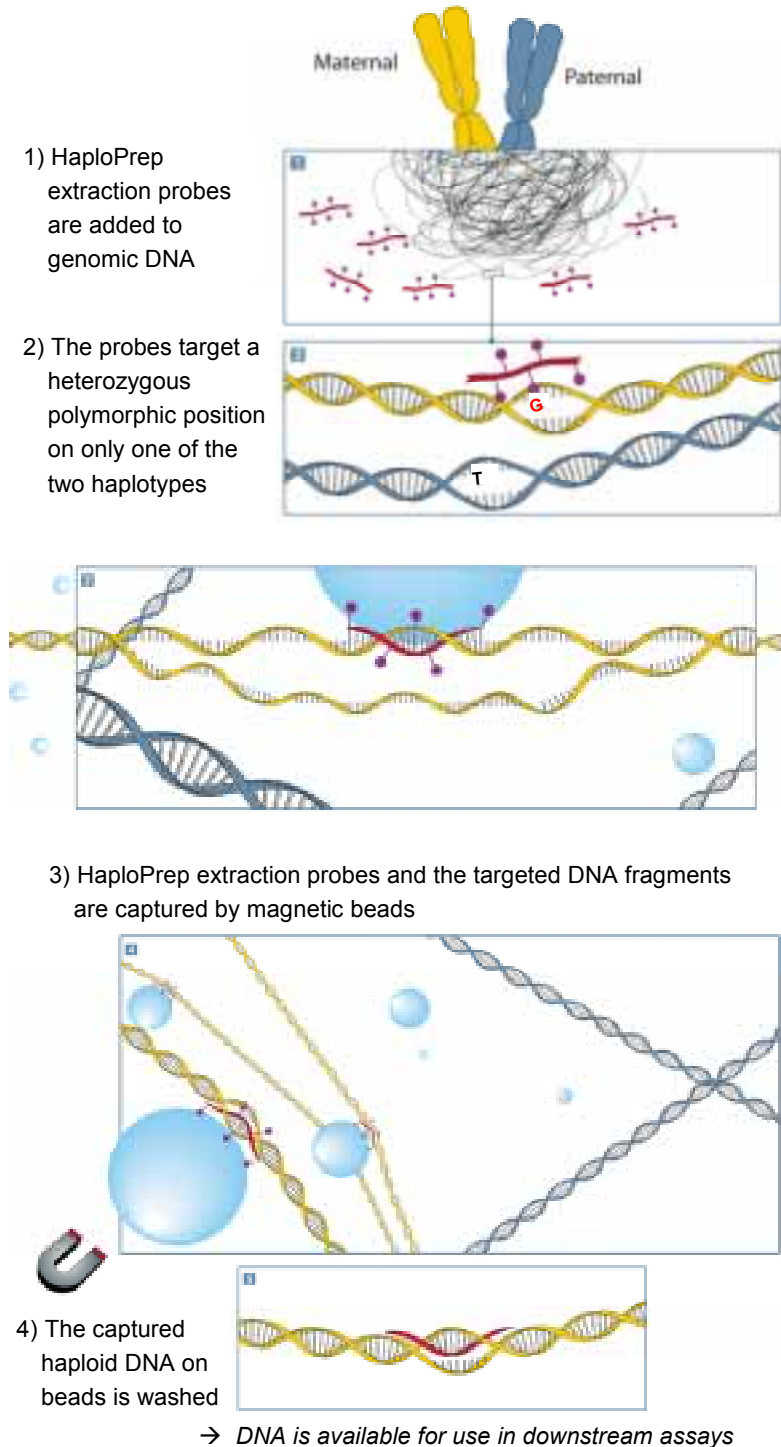
HSE has been tested with direct sequencing; forward sequence-specific oligonucleotide probes (SSO), reverse SSO, sequence-specific priming (SSP), homogeneous luminescent genotyping, and restriction fragment length polymorphism (RFLP) digests.

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

| DQB1 Probe # | Unique Sequence Element | Center Position | Exon |
|---------------------|--------------------------------|------------------------|-------------|
| DQB1-122T | GT <u>I</u> CC | 122 | 2 |
| DQB1-173A | TTAT <u>G</u> | 173 | 2 |
| DQB1-173G | GG <u>G</u> TG | 173 | 2 |
| DQB1-173T | TC <u>I</u> TG | 173 | 2 |
| DQB1-185G | AAG <u>C</u> A | 185 | 2 |
| DQB1-266T | TG <u>I</u> TG | 266 | 2 |
| DQB1-267T | GA <u>I</u> GC | 267 | 2 |
| DQB1-304G | AG <u>G</u> GG | 304 | 2 |
| DQB1-319T | AG <u>I</u> TG | 319 | 2 |
| DQB1-326C | CAC <u>G</u> G | 326 | 2 |
| DQB1-353C | GGC <u>G</u> T | 353 | 2 |
| DQB1-356T | GC <u>I</u> CC | 356 | 2 |

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-DQB1 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 **DQB1 Common Ambiguity Chart** list common ambiguities with the probes chosen for the user.
- The **Probe Charts** list 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 heterozygote 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*44:01 | B*46:01 | B*47:01 | B*48:01 | B*49:01 | B*50:01 | B*51:01 | B*52:01 | B*53:01 | B*54:01 | B*55:01 | B*56:01 | B*57:01 | B*58:01 | B*59:01 | B*60:01 | B*61:01 | B*62:01 | B*63:01 | B*64:01 | B*65:01 | B*66:01 | B*67:01 | B*68:01 | B*69:01 | B*70:01 | B*71:01 | B*72:01 | B*73:01 | B*74:01 | B*75:01 | B*76:01 | B*77:01 | B*78:01 | B*79:01 | B*80:01 | B*81:01 | B*82:01 | B*83:01 | B*84:01 | B*85:01 | B*86:01 | B*87:01 | B*88:01 | B*89:01 | B*90:01 | B*91:01 | B*92:01 | B*93:01 | B*94:01 | B*95:01 | B*96:01 | B*97:01 | B*98:01 | B*99:01 | B*100:01 | B*101:01 | B*102:01 | B*103:01 | B*104:01 | B*105:01 | B*106:01 | B*107:01 | B*108:01 | B*109:01 | B*110:01 | B*111:01 | B*112:01 | B*113:01 | B*114:01 | B*115:01 | B*116:01 | B*117:01 | B*118:01 | B*119:01 | B*120:01 | B*121:01 | B*122:01 | B*123:01 | B*124:01 | B*125:01 | B*126:01 | B*127:01 | B*128:01 | B*129:01 | B*130:01 | B*131:01 | B*132:01 | B*133:01 | B*134:01 | B*135:01 | B*136:01 | B*137:01 | B*138:01 | B*139:01 | B*140:01 | B*141:01 | B*142:01 | B*143:01 | B*144:01 | B*145:01 | B*146:01 | B*147:01 | B*148:01 | B*149:01 | B*150:01 | B*151:01 | B*152:01 | B*153:01 | B*154:01 | B*155:01 | B*156:01 | B*157:01 | B*158:01 | B*159:01 | B*160:01 | B*161:01 | B*162:01 | B*163:01 | B*164:01 | B*165:01 | B*166:01 | B*167:01 | B*168:01 | B*169:01 | B*170:01 | B*171:01 | B*172:01 | B*173:01 | B*174:01 | B*175:01 | B*176:01 | B*177:01 | B*178:01 | B*179:01 | B*180:01 | B*181:01 | B*182:01 | B*183:01 | B*184:01 | B*185:01 | B*186:01 | B*187:01 | B*188:01 | B*189:01 | B*190:01 | B*191:01 | B*192:01 | B*193:01 | B*194:01 | B*195:01 | B*196:01 | B*197:01 | B*198:01 | B*199:01 | B*200:01 | B*201:01 | B*202:01 | B*203:01 | B*204:01 | B*205:01 | B*206:01 | B*207:01 | B*208:01 | B*209:01 | B*210:01 | B*211:01 | B*212:01 | B*213:01 | B*214:01 | B*215:01 | B*216:01 | B*217:01 | B*218:01 | B*219:01 | B*220:01 | B*221:01 | B*222:01 | B*223:01 | B*224:01 | B*225:01 | B*226:01 | B*227:01 | B*228:01 | B*229:01 | B*230:01 | B*231:01 | B*232:01 | B*233:01 | B*234:01 | B*235:01 | B*236:01 | B*237:01 | B*238:01 | B*239:01 | B*240:01 | B*241:01 | B*242:01 | B*243:01 | B*244:01 | B*245:01 | B*246:01 | B*247:01 | B*248:01 | B*249:01 | B*250:01 | B*251:01 | B*252:01 | B*253:01 | B*254:01 | B*255:01 | B*256:01 | B*257:01 | B*258:01 | B*259:01 | B*260:01 | B*261:01 | B*262:01 | B*263:01 | B*264:01 | B*265:01 | B*266:01 | B*267:01 | B*268:01 | B*269:01 | B*270:01 | B*271:01 | B*272:01 | B*273:01 | B*274:01 | B*275:01 | B*276:01 | B*277:01 | B*278:01 | B*279:01 | B*280:01 | B*281:01 | B*282:01 | B*283:01 | B*284:01 | B*285:01 | B*286:01 | B*287:01 | B*288:01 | B*289:01 | B*290:01 | B*291:01 | B*292:01 | B*293:01 | B*294:01 | B*295:01 | B*296:01 | B*297:01 | B*298:01 | B*299:01 | B*300:01 | B*301:01 | B*302:01 | B*303:01 | B*304:01 | B*305:01 | B*306:01 | B*307:01 | B*308:01 | B*309:01 | B*310:01 | B*311:01 | B*312:01 | B*313:01 | B*314:01 | B*315:01 | B*316:01 | B*317:01 | B*318:01 | B*319:01 | B*320:01 | B*321:01 | B*322:01 | B*323:01 | B*324:01 | B*325:01 | B*326:01 | B*327:01 | B*328:01 | B*329:01 | B*330:01 | B*331:01 | B*332:01 | B*333:01 | B*334:01 | B*335:01 | B*336:01 | B*337:01 | B*338:01 | B*339:01 | B*340:01 | B*341:01 | B*342:01 | B*343:01 | B*344:01 | B*345:01 | B*346:01 | B*347:01 | B*348:01 | B*349:01 | B*350:01 | B*351:01 | B*352:01 | B*353:01 | B*354:01 | B*355:01 | B*356:01 | B*357:01 | B*358:01 | B*359:01 | B*360:01 | B*361:01 | B*362:01 | B*363:01 | B*364:01 | B*365:01 | B*366:01 | B*367:01 | B*368:01 | B*369:01 | B*370:01 | B*371:01 | B*372:01 | B*373:01 | B*374:01 | B*375:01 | B*376:01 | B*377:01 | B*378:01 | B*379:01 | B*380:01 | B*381:01 | B*382:01 | B*383:01 | B*384:01 | B*385:01 | B*386:01 | B*387:01 | B*388:01 | B*389:01 | B*390:01 | B*391:01 | B*392:01 | B*393:01 | B*394:01 | B*395:01 | B*396:01 | B*397:01 | B*398:01 | B*399:01 | B*400:01 | B*401:01 | B*402:01 | B*403:01 | B*404:01 | B*405:01 | B*406:01 | B*407:01 | B*408:01 | B*409:01 | B*410:01 | B*411:01 | B*412:01 | 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B*868:01 | B*869:01 | B*870:01 | B*871:01 | B*872:01 | B*873:01 | B*874:01 | B*875:01 | B*876:01 | B*877:01 | B*878:01 | B*879:01 | B*880:01 | B*881:01 | B*882:01 | B*883:01 | B*884:01 | B*885:01 | B*886:01 | B*887:01 | B*888:01 | B*889:01 | B*890:01 | B*891:01 | B*892:01 | B*893:01 | B*894:01 | B*895:01 | B*896:01 | B*897:01 | B*898:01 | B*899:01 | B*900:01 | B*901:01 | B*902:01 | B*903:01 | B*904:01 | B*905:01 | B*906:01 | B*907:01 | B*908:01 | B*909:01 | B*910:01 | B*911:01 | B*912:01 | B*913:01 | B*914:01 | B*915:01 | B*916:01 | B*917:01 | B*918:01 | B*919:01 | B*920:01 | B*921:01 | B*922:01 | B*923:01 | B*924:01 | B*925:01 | B*926:01 | B*927:01 | B*928:01 | B*929:01 | B*930:01 | B*931:01 | B*932:01 | B*933:01 | B*934:01 | B*935:01 | B*936:01 | B*937:01 | B*938:01 | B*939:01 | B*940:01 | B*941:01 | B*942:01 | B*943:01 | B*944:01 | B*945:01 | B*946:01 | B*947:01 | B*948:01 | B*949:01 | B*950:01 | B*951:01 | B*952:01 | B*953:01 | B*954:01 | B*955:01 | B*956:01 | B*957:01 | B*958:01 | B*959:01 | B*960:01 | B*961:01 | B*962:01 | B*963:01 | B*964:01 | B*965:01 | B*966:01 | B*967:01 | B*968:01 | B*969:01 | B*970:01 | B*971:01 | B*972:01 | B*973:01 | B*974:01 | B*975:01 | B*976:01 | B*977:01 | B*978:01 | B*979:01 | B*980:01 | B*981:01 | B*982:01 | B*983:01 | B*984:01 | B*985:01 | B*986:01 | B*987:01 | B*988:01 | B*989:01 | B*990:01 | B*991:01 | B*992:01 | B*993:01 | B*994:01 | B*995:01 | B*996:01 | B*997:01 | B*998:01 | B*999:01 | B*1000:01 |
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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]

- For example, there is an indication from initial typing that a sample consists of two different types of B07: B*0701 and B*0703. HLA-B*0703 is listed as a non-targeted allele for probes B277G1, B277G2, and B48A (see column titled 'Alleles Not Targeted'). Since B*0701 is not listed as an unknown sequence comparison or weakly targeted allele for these probes, any of these probes will extract B*0701 from this sample.

- 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.**

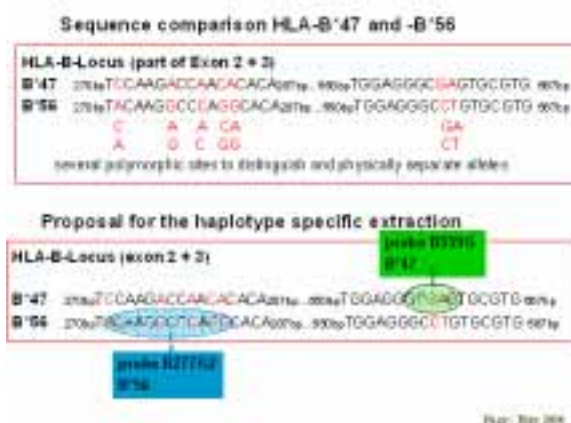
- For example, a sample has a low-resolution type of HLA-B*07xx and HLA-B*44xx. If you select B7 from the top row (group one) and B44 from the first column (group two) of the chart, probes B277G1 and B277G2 are listed in white intersecting cells and will extract B7. Probes B277A and B261G are listed in grey intersecting cells and will extract B44; however, probes B277A and B261G are listed in **bold**, which mean these probes may capture some alleles in the B7 group – check the allele level chart before use.

| | | |
|-----|--------|--------------|
| xly | B7 | |
| B7 | | |
| | | |
| B8 | B559G | B277A |
| | B277G1 | |
| | B277G2 | |
| B13 | B261C | B261G |
| | B277G1 | |
| | B277G2 | |
| B14 | B559G | B277A |
| | B277G1 | |
| | B277G2 | |
| B40 | B277G1 | B277A |
| | B277G2 | B261G |
| B41 | B261C | B277A |
| | B559G | B539A |
| | B277G1 | |
| B42 | B559G | B539A |
| | | |
| B44 | B277G1 | B277A |
| | B277G2 | B261G |

- Some samples may not have probes that will extract both alleles, but all low-resolution allele combinations will have a probe to extract one of the alleles, and a probe that will extract at least some of the alleles from the second allele group.

- 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 Alignment Tool

Select Exon:

Select the nucleotide sites:

Enter any specific sequences to align:

Enter the reference sequence:

Select the type of alignment:

Select how the alignment will be displayed:

What allele discrepancy for this region:

Select type of output:

Processed with alignment:

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*4701.01 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*4701.02 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*4702 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*4703 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*4704 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*4705 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5601 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5602 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5603 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5604 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5605 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5606 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5607 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5608 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5609 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5610 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5611 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5612 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5613 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5614 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5615 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |
| D*5616 | CCGACGCAAG | TGGAGAGCGG | CCCGTGAAGC | GGAGGAGCGG | AGAGGCTAAC | TGGAGAGCGG | TGGCTCCGCA | GGAGGAGCGG | GGAGGAGCGG | GGAGGAGCGG |

HLA-DQB1 Probe Matrix:

| | DQB1 *02 | | DQB1 *03 | | DQB1 *04 | | DQB1 *05 | | DQB1 *06 | |
|-------------|-------------|------|-------------|-------------|-------------|------|-------------|------|-------------|-------------|
| DQB1 *02 | | | 326C | 185G | 122T | 185G | 353C | 185G | 326C | 185G |
| | | | 319T | | 173G | 173T | 173G | 173T | 319T | 356T |
| | | | 173A | | | | 304G | | 304G | |
| DQB1 *03 | 185G | 326C | | | 122T | | 353C | 319T | 353C | 356T |
| | | 319T | | | 173G | 319T | 173G | 326C | 266T | |
| | | 173A | | | | 326C | 304G | | 267T | |
| DQB1 *04 | 185G | 122T | | 122T | | | 304G | 122T | 173T | 356T |
| | 173T | 173G | 319T | 173G | | | 353C | 356T | 319T | 173G |
| | | | 326C | | | | | | 326C | |
| DQB1 *05 | 185G | 353C | 319T | 353C | 122T | 304G | | | 173T | 173G |
| | 173T | 173G | 326C | 173G | 356T | 353C | | | 319T | |
| | | 304G | | 304G | | | | | 326C | |
| DQB1 *06 | 185G | 326C | 356T | 353C | 356T | 173T | 173G | 173T | | |
| | 356T | 319T | | 266T | 173G | 319T | | 319T | | |
| | 367C | 304G | | 267T | | 326C | | 326C | | |

HLA-DQB1 Allele Level Chart:

| Allele | 122T | 173A | 173G | 173T | 185G | 266T | 267C | 267T | 304G | 319T | 326C | 353C | 356T |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| DQB1*020101 | | | | | | | | | | | | | |
| DQB1*020102 | | | | | | | | | | | | | |
| DQB1*0202 | | | | | | | | | | | | | |
| DQB1*0203 | | | | | | | | | | | | | |
| DQB1*0204 | | | | | | | | | | | | | |
| DQB1*030101 | | | | | | | | | | | | | |
| DQB1*030102 | | | | | | | | | | | | | |
| DQB1*030201 | | | | | | | | | | | | | |
| DQB1*030202 | | | | | | | | | | | | | |
| DQB1*030302 | | | | | | | | | | | | | |
| DQB1*030303 | | | | | | | | | | | | | |
| DQB1*0304 | | | | | | | | | | | | | |
| DQB1*030501 | | | | | | | | | | | | | |
| DQB1*030502 | | | | | | | | | | | | | |
| DQB1*030503 | | | | | | | | | | | | | |
| DQB1*0306 | | | | | | | | | | | | | |
| DQB1*0307 | | | | | | | | | | | | | |
| DQB1*0308 | | | | | | | | | | | | | |
| DQB1*0309 | | | | | | | | | | | | | |
| DQB1*0310 | | | | | | | | | | | | | |
| DQB1*0311 | | | | | | | | | | | | | |
| DQB1*0312 | | | | | | | | | | | | | |
| DQB1*0313 | | | | | | | | | | | | | |
| DQB1*0314 | | | | | | | | | | | | | |
| DQB1*0315 | | | | | | | | | | | | | |
| DQB1*0316 | | | | | | | | | | | | | |
| DQB1*0317 | | | | | | | | | | | | | |
| DQB1*0401 | | | | | | | | | | | | | |
| DQB1*0402 | | | | | | | | | | | | | |
| DQB1*050101 | | | | | | | | | | | | | |
| DQB1*050102 | | | | | | | | | | | | | |
| DQB1*050201 | | | | | | | | | | | | | |
| DQB1*050202 | | | | | | | | | | | | | |
| DQB1*050301 | | | | | | | | | | | | | |
| DQB1*050302 | | | | | | | | | | | | | |
| DQB1*0504 | | | | | | | | | | | | | |

| Allele | 122T | 173A | 173G | 173T | 185G | 266T | 267C | 267T | 304G | 319T | 326C | 353C | 356T |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| DQB1*060101 | | | | | | | | | | | | | |
| DQB1*060102 | | | | | | | | | | | | | |
| DQB1*060103 | | | | | | | | | | | | | |
| DQB1*0602 | | | | | | | | | | | | | |
| DQB1*0603 | | | | | | | | | | | | | |
| DQB1*060401 | | | | | | | | | | | | | |
| DQB1*060402 | | | | | | | | | | | | | |
| DQB1*060501 | | | | | | | | | | | | | |
| DQB1*060502 | | | | | | | | | | | | | |
| DQB1*0606 | | | | | | | | | | | | | |
| DQB1*0607 | | | | | | | | | | | | | |
| DQB1*0608 | | | | | | | | | | | | | |
| DQB1*0609 | | | | | | | | | | | | | |
| DQB1*0610 | | | | | | | | | | | | | |
| DQB1*061101 | | | | | | | | | | | | | |
| DQB1*061102 | | | | | | | | | | | | | |
| DQB1*0612 | | | | | | | | | | | | | |
| DQB1*0613 | | | | | | | | | | | | | |
| DQB1*0614 | | | | | | | | | | | | | |
| DQB1*0615 | | | | | | | | | | | | | |
| DQB1*0616 | | | | | | | | | | | | | |
| DQB1*0617 | | | | | | | | | | | | | |
| DQB1*0618 | | | | | | | | | | | | | |
| DQB1*0619 | | | | | | | | | | | | | |
| DQB1*0620 | | | | | | | | | | | | | |
| DQB1*0621 | | | | | | | | | | | | | |
| DQB1*0622 | | | | | | | | | | | | | |
| DQB1*0623 | | | | | | | | | | | | | |
| DQB1*0624 | | | | | | | | | | | | | |
| DQB1*0625 | | | | | | | | | | | | | |
| DQB1*0626N | | | | | | | | | | | | | |
| DQB1*0627 | | | | | | | | | | | | | |

HLA-DQB1 Serology Group Chart:

| Allele | Probe | Alleles Not Targeted |
|----------------|-------|---|
| DQB1*02 | 173T | |
| | 185G | |
| | 267C | |
| | 356T | |
| DQB1*03 | 267C | |
| | 326C | |
| | 356T | |
| | 319T | DQB1*0306 |
| | 173T | DQB1*030101, 030102, 0304-030503, 0309, 0310, 0313, 0314, 0316, 0317 |
| | 173A | DQB1*030201-030303, 030501-0308, 0311, 0312, 0315, 0317 |
| | 173G | DQB1*030101-0304, 0306-0317 |
| | 304G | DQB1*030101-0307, 0309-0317 |
| | | |
| DQB1*04 | 122T | |
| | 173G | |
| | 356T | |
| DQB1*05 | 173G | |
| | 353C | |
| | 304G | DQB1*0504 |
| | 266T | DQB1*050201-0504 |
| | 267C | DQB1*050101-050202, 050302, 0504 |
| | 267T | DQB1*050101-050301, 0504 |
| | | |
| DQB1*06 | 173T | DQB1*060101-060103, 0623 |
| | 326C | DQB1*060101-060103, 0606 |
| | 319T | DQB1*060101-060103, 0606, 0617, 0624 |
| | 353C | DQB1*060401-060502, 0607, 0609, 0612, 0615, 0617, 0621, 0622, 0625 |
| | 304G | DQB1*060101-060103, 060401-0607, 0609, 0615, 0618, 0622, 0625, 0627 |
| | 266T | DQB1*060101-0603, 060502, 0607, 0610-061102, 0614-0616, 0619, 0620, 0623-0626N |
| | 267T | DQB1*060101-060103, 060401-0606, 0608-0610, 0612, 0613, 0617, 0618, 0620-0622, 0625, 0627 |
| | 122T | DQB1*060101-060103, 0603-0609, 061101-0612, 0617, 0618, 0621, 0625-0627 |
| | 267C | DQB1*0602-0627 |
| | 173A | DQB1*0602-0627 |
| | 173G | DQB1*060101-0622, 0624-0627 |
| | | |
| | | |
| | | |

DQB1 Common Ambiguity Chart:

| DQB1* - Allele1 | DQB1* - Allele2 | Probe1 | Probe2 |
|------------------------|------------------------|---------------|---------------|
| DQB1*03(01, 09) | DQB1*03(02) | 173A | 173T |
| DQB1*03(01,09) | DQB1*0303 | 173A | 173T |
| DQB1*03(01,09) | DQB1*0305 | 173A | 173G |
| DQB1*03(02,11) | DQB1*06(09) | 356T | 266T |
| DQB1*03(02,11) | DQB1*0606 | 356T | 266T |
| DQB1*03(02,08) | DQB1*06(12,09) | 356T | 266T |
| DQB1*03(02,11) | DQB1*06(20,02) | 356T | 304G |
| DQB1*03(02,08) | DQB1*06(21,04) | 356T | 266T |
| DQB1*03(03,12) | DQB1*0606 | 356T | 267T |
| DQB1*03(08,11) | DQB1*06(05,12) | 356T | 266T |
| DQB1*05(01,02) | DQB1*06(10,13) | 173G | 173T |
| DQB1*05(02,03) | DQB1*06(02,10) | 173G | 173T |
| DQB1*06(02,11) | DQB1*06(03,14) | 267T | 266T |
| DQB1*06(02,07) | DQB1*06(04,13) | 267T | 266T |
| DQB1*06(02,03) | DQB1*06(08,13) | 267T | 266T |
| DQB1*06(03,07) | DQB1*06(04,08) | 267T | 266T |
| DQB1*06(03,11) | DQB1*06(12,21) | 267T | 266T |

HLA-DQB1 Probe DQB122T

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-122T | 25 Separations | 4335001 |

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

| | | |
|----------------|---------------|------|
| USE | center nt pos | exon |
| GT <u>I</u> CC | 122 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*0401, DQB1*0402, DQB1*0602, DQB1*0610, DQB1*0613, DQB1*0614,
DQB1*0615, DQB1*0616, DQB1*0619, DQB1*0620, DQB1*0622, DQB1*0623,
DQB1*0624

Non HLA-DQB1 Alleles Targeted :

N/A

HLA-DQB1 Probe DQB173A

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-173A | 25 Separations | 4335002 |

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

| | | |
|-------|---------------|------|
| USE | center nt pos | exon |
| TTATG | 173 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*030101, DQB1*030102, DQB1*0304, DQB1*0309, DQB1*0310, DQB1*0313,
DQB1*0314, DQB1*0316, DQB1*060101, DQB1*060102, DQB1*060103

Non HLA-DQB1 Alleles Targeted :

N/A

HLA-DQB1 Probe DQB173G

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-173G | 25 Separations | 4335003 |

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

| | | |
|----------------|---------------|------|
| USE | center nt pos | exon |
| GG <u>G</u> TG | 173 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*030501, DQB1*030502, DQB1*030503, DQB1*0401, DQB1*0402,
DQB1*050101, DQB1*050102, DQB1*050201, DQB1*050202, DQB1*050301,
DQB1*050302, DQB1*0504, DQB1*0623

Non HLA-DQB1 Alleles Targeted :

N/A

HLA-DQB1 Probe DQB173T

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-173T | 25 Separations | 4335004 |

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

| | | |
|-------|---------------|------|
| USE | center nt pos | exon |
| TCITG | 173 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*020101, DQB1*020102, DQB1*0202, DQB1*0203, DQB1*0204, DQB1*030201, DQB1*030202, DQB1*030302, DQB1*030303, DQB1*0306, DQB1*0307, DQB1*0308, DQB1*0311, DQB1*0312, DQB1*0315, DQB1*0602, DQB1*0603, DQB1*060401, DQB1*060402, DQB1*060501, DQB1*060502, DQB1*0606, DQB1*0607, DQB1*0608, DQB1*0609, DQB1*0610, DQB1*061101, DQB1*061102, DQB1*0612, DQB1*0613, DQB1*0614, DQB1*0615, DQB1*0616, DQB1*0617, DQB1*0618, DQB1*0619, DQB1*0620, DQB1*0621, DQB1*0622, DQB1*0624, DQB1*0625, DQB1*0626N, DQB1*0627

Non HLA-DQB1 Alleles Targeted :

N/A

HLA-DQB1 Probe DQB185G

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-185G | 25 Separations | 4335005 |

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

| | | |
|-------|---------------|------|
| USE | center nt pos | exon |
| AAGCA | 185 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*020101, DQB1*020102, DQB1*0202, DQB1*0203, DQB1*0204

Non HLA-DQB1 Alleles Targeted :

N/A

HLA-DQB1 Probe DQB266T

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-266T | 25 Separations | 4335006 |

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

| | | |
|----------------|---------------|------|
| USE | center nt pos | exon |
| TG <u>I</u> TG | 266 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*050101, DQB1*050102, DQB1*060401, DQB1*060402, DQB1*060501,
DQB1*0606, DQB1*0608, DQB1*0609, DQB1*0612, DQB1*0613, DQB1*0617,
DQB1*0618, DQB1*0621, DQB1*0622, DQB1*0627

Non HLA-DQB1 Alleles Targeted :

DRB1*0807, DRB3*010103

HLA-DQB1 Probe DQB267T

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-267T | 25 Separations | 4335008 |

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

| | | |
|-------|---------------|------|
| USE | center nt pos | exon |
| GATGC | 267 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*050302, DQB1*0602, DQB1*0603, DQB1*0607, DQB1*061101, DQB1*061102, DQB1*0614, DQB1*0615, DQB1*0616, DQB1*0619, DQB1*0620, DQB1*0623, DQB1*0624, DQB1*0626N

Non HLA-DQB1 Alleles Targeted :

DMA*0101, DMA*0103, DPB1*010101, DPB1*010102, DPB1*010103, DPB1*020102, DPB1*020104, DPB1*020105, DPB1*020106, DPB1*030101, DPB1*030102, DPB1*0302, DPB1*040101, DPB1*040102, DPB1*0402, DPB1*0403, DPB1*0502, DPB1*0601, DPB1*0602, DPB1*0801, DPB1*0901, DPB1*0902, DPB1*1001, DPB1*1002, DPB1*110101, DPB1*110102, DPB1*1102, DPB1*1301, DPB1*1302, DPB1*1401, DPB1*1402, DPB1*1501, DPB1*1601, DPB1*1701, DPB1*1801, DPB1*200101, DPB1*200102, DPB1*2301, DPB1*2501, DPB1*260101, DPB1*260102, DPB1*2701, DPB1*2801, DPB1*2901, DPB1*3101, DPB1*3201, DPB1*3301, DPB1*3401, DPB1*3501, DPB1*3701, DPB1*3901, DPB1*4001, DPB1*4101, DPB1*4401, DPB1*4501, DPB1*4601, DPB1*4801, DPB1*4901, DPB1*5001, DPB1*5101, DPB1*5201, DPB1*5301, DPB1*5501, DPB1*5601, DPB1*5701, DPB1*5801, DPB1*5901, DPB1*6001, DPB1*6101N, DPB1*6201, DPB1*6301, DPB1*6401N, DPB1*6501, DPB1*6601, DPB1*6701, DPB1*6801, DPB1*6901, DPB1*7001, DPB1*7101, DPB1*7201, DPB1*7301, DPB1*7401, DPB1*7501, DPB1*7601, DPB1*7701, DPB1*7801, DPB1*7901, DPB1*8001, DPB1*8101, DPB1*8201, DPB1*8301, DPB1*8501, DPB1*8601, DPB1*8701, DPB1*8801, DPB1*8901, DPB1*9001, DPB1*9101, DPB1*9201, DPB1*9301, DPB1*9401, DPB1*9501, DPB1*9601, DPB1*9801, DPB1*9901, DRB1*0113, DRB1*030101, DRB1*030102, DRB1*030201, DRB1*030202, DRB1*0303, DRB1*0304, DRB1*030501, DRB1*030502, DRB1*0306, DRB1*0307, DRB1*0308, DRB1*0309, DRB1*0310, DRB1*0311, DRB1*0313, DRB1*0314, DRB1*0315, DRB1*0316, DRB1*0317, DRB1*0318, DRB1*0319, DRB1*0320, DRB1*0321, DRB1*0322, DRB1*0323, DRB1*0324, DRB1*0325, DRB1*0326, DRB1*0327, DRB1*0328, DRB1*040101, DRB1*040102, DRB1*0402, DRB1*040301, DRB1*0404, DRB1*040601, DRB1*040602, DRB1*040701, DRB1*040702, DRB1*040703, DRB1*0408, DRB1*0413, DRB1*0414, DRB1*0415, DRB1*0416, DRB1*0418, DRB1*0419, DRB1*0420, DRB1*0421, DRB1*0422, DRB1*0423, DRB1*0425, DRB1*0427, DRB1*0431, DRB1*0432, DRB1*0433, DRB1*0434, DRB1*0435, DRB1*0436, DRB1*0437, DRB1*0438, DRB1*0439, DRB1*0440, DRB1*0441, DRB1*0442, DRB1*0443, DRB1*0444, DRB1*0446, DRB1*0447, DRB1*0449, DRB1*0450, DRB1*0451, DRB1*0452, DRB1*0453, DRB1*0454, DRB1*0455, DRB1*0456, DRB1*080201, DRB1*080202, DRB1*080203, DRB1*080401, DRB1*080402, DRB1*080403, DRB1*080404, DRB1*0808, DRB1*0809, DRB1*0811, DRB1*0813, DRB1*0815, DRB1*0820, DRB1*0821, DRB1*0824, DRB1*0828, DRB1*0830, DRB1*100101, DRB1*100102, DRB1*110101, DRB1*110102, DRB1*110103, DRB1*110104, DRB1*110105,

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DRB1*110106, DRB1*110201, DRB1*110202, DRB1*1103, DRB1*110401,
DRB1*110402, DRB1*110403, DRB1*1105, DRB1*110601, DRB1*110602, DRB1*1107,
DRB1*110801, DRB1*110802, DRB1*1109, DRB1*1110, DRB1*111101, DRB1*111102,
DRB1*111201, DRB1*111202, DRB1*1113, DRB1*111401, DRB1*111402, DRB1*1115,
DRB1*1116, DRB1*1117, DRB1*1118, DRB1*111901, DRB1*111902, DRB1*1120,
DRB1*1121, DRB1*1122, DRB1*1123, DRB1*1124, DRB1*1125, DRB1*1126,
DRB1*112701, DRB1*112702, DRB1*1128, DRB1*1129, DRB1*1130, DRB1*1131,
DRB1*1132, DRB1*1133, DRB1*1134, DRB1*1135, DRB1*1136, DRB1*1137,
DRB1*1138, DRB1*1139, DRB1*1140, DRB1*1141, DRB1*1142, DRB1*1143,
DRB1*1144, DRB1*1145, DRB1*1146, DRB1*1147, DRB1*1148, DRB1*1149,
DRB1*1150, DRB1*1151, DRB1*1152, DRB1*1153, DRB1*1154, DRB1*1204,
DRB1*1209, DRB1*130101, DRB1*130102, DRB1*130103, DRB1*130201,
DRB1*130202, DRB1*130501, DRB1*130502, DRB1*1306, DRB1*130701, DRB1*1308,
DRB1*1309, DRB1*1310, DRB1*1311, DRB1*131401, DRB1*1315, DRB1*1316,
DRB1*1329, DRB1*1334, DRB1*1335, DRB1*1336, DRB1*1337, DRB1*1339,
DRB1*1340, DRB1*1341, DRB1*1342, DRB1*1343, DRB1*1344, DRB1*1345,
DRB1*1347, DRB1*1350, DRB1*1351, DRB1*1352, DRB1*1353, DRB1*1356,
DRB1*1357, DRB1*1359, DRB1*1361, DRB1*1362, DRB1*1363, DRB1*1364,
DRB1*1367, DRB1*1368, DRB1*1369, DRB1*140101, DRB1*140102, DRB1*140103,
DRB1*1402, DRB1*140301, DRB1*140302, DRB1*1404, DRB1*140501, DRB1*140502,
DRB1*1406, DRB1*140701, DRB1*140702, DRB1*1408, DRB1*1409, DRB1*1410,
DRB1*1411, DRB1*1412, DRB1*1414, DRB1*1415, DRB1*1416, DRB1*1417,
DRB1*1418, DRB1*1419, DRB1*1420, DRB1*1421, DRB1*1422, DRB1*142301,
DRB1*142302, DRB1*1424, DRB1*1425, DRB1*1426, DRB1*1427, DRB1*1428,
DRB1*1429, DRB1*1430, DRB1*1431, DRB1*1432, DRB1*1433, DRB1*1434,
DRB1*1435, DRB1*1436, DRB1*1437, DRB1*1438, DRB1*1439, DRB1*1440,
DRB1*1441, DRB1*1442, DRB1*1443, DRB1*1444, DRB1*1445, DRB1*1446,
DRB1*1447, DRB1*1449, DRB1*1450, DRB1*1451, DRB1*1452, DRB1*1453,
DRB1*150104, DRB1*150202, DRB3*0107, DRB3*0201, DRB3*020201, DRB3*020202,
DRB3*020203, DRB3*020204, DRB3*0203, DRB3*0204, DRB3*0205, DRB3*0206,
DRB3*0210, DRB3*0211, DRB3*0212, DRB3*0213, DRB3*0214, DRB3*0215,
DRB3*0216, DRB3*0217, DRB3*0218, DRB3*0219, DRB3*0220, DRB5*0113

HLA-DQB1 Probe DQB304G

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-304G | 25 Separations | 4335009 |

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

| | | |
|-------|---------------|------|
| USE | center nt pos | exon |
| AGGGG | 304 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*0308, DQB1*050101, DQB1*050102, DQB1*050201, DQB1*050202,
DQB1*050301, DQB1*050302, DQB1*0602, DQB1*0603, DQB1*0608, DQB1*0610,
DQB1*061101, DQB1*061102, DQB1*0612, DQB1*0613, DQB1*0614, DQB1*0616,
DQB1*0617, DQB1*0619, DQB1*0620, DQB1*0621, DQB1*0623, DQB1*0624,
DQB1*0626N

Non HLA-DQB1 Alleles Targeted:

N/A

HLA-DQB1 Probe DQB319T

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-319T | 25 Separations | 43350011 |

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

| | | |
|----------------|---------------|------|
| USE | center nt pos | exon |
| AGT <u>T</u> G | 319 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*030101, DQB1*030102, DQB1*030201, DQB1*030202, DQB1*030302,
DQB1*030303, DQB1*0304, DQB1*030501, DQB1*030502, DQB1*030503,
DQB1*0307, DQB1*0308, DQB1*0309, DQB1*0310, DQB1*0311, DQB1*0312,
DQB1*0313, DQB1*0314, DQB1*0315, DQB1*0316, DQB1*0317, DQB1*0602,
DQB1*0603, DQB1*060401, DQB1*060402, DQB1*060501, DQB1*060502,
DQB1*0607, DQB1*0608, DQB1*0609, DQB1*0610, DQB1*061101, DQB1*061102,
DQB1*0612, DQB1*0613, DQB1*0614, DQB1*0615, DQB1*0616, DQB1*0618,
DQB1*0619, DQB1*0620, DQB1*0621, DQB1*0622, DQB1*0623, DQB1*0625,
DQB1*0626N, DQB1*0627

Non HLA-DQB1 Alleles Targeted :

N/A

HLA-DQB1 Probe DQB326C

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-326C | 25 Separations | 43350012 |

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

| | | |
|---------------|---------------|------|
| USE | center nt pos | exon |
| CAC <u>GG</u> | 326 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*030101, DQB1*030102, DQB1*030201, DQB1*030302, DQB1*030303, DQB1*0304, DQB1*030501, DQB1*030502, DQB1*030503, DQB1*0307, DQB1*0308, DQB1*0309, DQB1*0310, DQB1*0311, DQB1*0312, DQB1*0313, DQB1*0314, DQB1*0315, DQB1*0316, DQB1*0317, DQB1*0602, DQB1*0603, DQB1*060401, DQB1*060402, DQB1*060501, DQB1*060502, DQB1*0607, DQB1*0608, DQB1*0609, DQB1*0610, DQB1*061101, DQB1*061102, DQB1*0612, DQB1*0613, DQB1*0614, DQB1*0615, DQB1*0616, DQB1*0617, DQB1*0618, DQB1*0619, DQB1*0620, DQB1*0621, DQB1*0622, DQB1*0623, DQB1*0624, DQB1*0625, DQB1*0626N, DQB1*0627

Non HLA-DQB1 Alleles Targeted:

DRB1*040301, DRB1*040302, DRB1*040601, DRB1*040602, DRB1*040701, DRB1*040702, DRB1*040703, DRB1*0411, DRB1*0417, DRB1*0420, DRB1*0427, DRB1*0439, DRB1*0441, DRB1*0446, DRB1*0449, DRB1*0450, DRB1*0451, DRB1*0452, DRB1*0829, DRB1*090102, DRB1*090103, DRB1*0902, DRB1*0904, DRB1*0905, DRB1*1117, DRB1*1152, DRB1*1154, DRB1*140101, DRB1*140102, DRB1*140103, DRB1*1404, DRB1*140501, DRB1*140502, DRB1*140701, DRB1*140702, DRB1*1408, DRB1*1410, DRB1*1411, DRB1*1414, DRB1*1418, DRB1*142301, DRB1*142302, DRB1*1426, DRB1*1428, DRB1*1433, DRB1*1435, DRB1*1436, DRB1*1439, DRB1*1442, DRB1*1444, DRB1*1445, DRB1*1451, DRB4*01010101, DRB4*01030101, DRB4*01030102N, DRB4*010302, DRB4*010303, DRB4*010304, DRB4*0105, DRB4*0106, DRB4*0107, DRB4*0201N, DRB5*0112, DQB1*030101, DQB1*030102, DQB1*030201, DQB1*030202, DQB1*030302, DQB1*030303, DQB1*0304, DQB1*030501, DQB1*030502, DQB1*030503, DQB1*0307, DQB1*0308, DQB1*0309, DQB1*0310, DQB1*0311, DQB1*0312, DQB1*0313, DQB1*0314, DQB1*0315, DQB1*0316, DQB1*0317, DQB1*050302, DQB1*060101, DQB1*060102, DQB1*060103, DQB1*0602, DQB1*0603, DQB1*060401, DQB1*060402, DQB1*060501, DQB1*060502, DQB1*0607, DQB1*0608, DQB1*0609, DQB1*0610, DQB1*061101, DQB1*061102, DQB1*0612, DQB1*0613, DQB1*0614, DQB1*0615, DQB1*0616, DQB1*0617, DQB1*0618, DQB1*0619, DQB1*0620, DQB1*0621, DQB1*0622, DQB1*0623, DQB1*0624, DQB1*0625, DQB1*0626N, DQB1*0627

HLA-DQB1 Probe DQB353C

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-353C | 25 Separations | 43350013 |

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

| | | |
|----------------|---------------|------|
| USE | center nt pos | exon |
| GG <u>C</u> GT | 353 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*050101, DQB1*050102, DQB1*050201, DQB1*050202, DQB1*050301,
DQB1*050302, DQB1*0504, DQB1*060101, DQB1*060103, DQB1*0602, DQB1*0603,
DQB1*0606, DQB1*0608, DQB1*0610, DQB1*061101, DQB1*061102, DQB1*0613,
DQB1*0614, DQB1*0616, DQB1*0618, DQB1*0619, DQB1*0620, DQB1*0623,
DQB1*0624, DQB1*0626N, DQB1*0627

Non HLA-DQB1 Alleles Targeted :

N/A

HLA-DQB1 Probe DQB356T

| Product Name | Size | Product Number |
|-------------------------|----------------|----------------|
| HaploPrep HLA-DQB1-353C | 25 Separations | 43350014 |

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

| | | |
|-------|---------------|------|
| USE | center nt pos | exon |
| GCTCC | 356 | 2 |

HLA-DQB1 Alleles Targeted:

DQB1*020101, DQB1*020102, DQB1*0202, DQB1*0203, DQB1*0204, DQB1*030101, DQB1*030102, DQB1*030201, DQB1*030202, DQB1*030302, DQB1*030303, DQB1*0304, DQB1*030501, DQB1*030502, DQB1*030503, DQB1*0306, DQB1*0307, DQB1*0308, DQB1*0309, DQB1*0310, DQB1*0311, DQB1*0312, DQB1*0313, DQB1*0314, DQB1*0315, DQB1*0316, DQB1*0317, DQB1*0401, DQB1*0402, DQB1*060102, DQB1*060502

Non HLA-DQB1 Alleles Targeted :

N/A