

Olerup SSP® DQ-DR SSP Combi Tray

Product number:	101.704-48u/12u – without <i>Taq</i> pol.
Lot number:	17H
Expiry date:	2012-April-01
Number of tests:	48 tests – Product No. 101.704-48u 12 tests – Product No. 101.704-12u
Number of wells per test:	31 + 1
Storage - pre-aliquoted primers:	dark at -20°C
- PCR Master Mix:	-20°C
- Adhesive PCR seals	RT
- Product Insert	RT

This Product Description is only valid for Lot No. 17H.

CHANGES COMPARED TO THE PREVIOUS OLERUP SSP® DQ-DR SSP COMBI TRAY LOT

The DQ low resolution specificity and interpretation tables have been updated for the HLA-DQB1 alleles described since the previous *Olerup SSP®* DQ-DR Combi Tray lot was made (**Lot No. 93F**).

The primers of the wells detailed below have been exchanged, added or modified compared to the previous lot.

Well	5'-primer	3'-primer	rationale
4	Removed, added	Removed, added	Primer pair from well 5.
5	Exchanged	Exchanged	Improved resolution of the DQ7, DQ8 and DQ9 specificities.
6	-	Exchanged	Improved resolution of the DQ7, DQ8 and DQ9 specificities.
7	Added	-	Primer added for the DQB1*0325 allele.

The DR low resolution specificity and interpretation tables have been updated for the HLA-DRB1 alleles described since the previous *Olerup SSP®* DQ-DR Combi Tray lot was made (**Lot No.93F**).

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The primers of the wells detailed below have been exchanged, added or modified compared to the previous lot.

Well	5'-primer	3'-primer	rationale
1	-	Added	Primers added for the DRB1*0123 and DRB1*0124 alleles.
3	-	Exchanged	Improved separation of DRB1*15 and DRB1*16 alleles.
5	Added	-	Primer added for the DRB1*0342 allele.
18	Added	Added	Primer pair added for the DRB4*01030102N allele.
21	Added	-	Primer added for the DRB1*0114 allele.
22	-	Added	Primer added for the DRB4*0108 allele.

Change in revision R01 compared to R00:

1. The DRB1*1419 and 1421 alleles are weakly amplified in primer mix 27.

Change in revision R02 compared to R01:

1. The DQB1*0304 and 0314 alleles are weakly amplified by primer mix 5.

Well **32** contains Negative Control primer pairs, that will amplify more than 95% of the *Olerup* SSP[®] HLA Class I, DRB, DQB1 and DPB1 amplicons as well as the amplicons generated by control primer pairs.

PCR product sizes range from 75 to 430 base pairs.

The product

Length of PCR product	105	200	105	80	75	80
5'-primer¹	164	340	440	45	45	43
	5'-CAC ^{3'}	5'-Agg ^{3'}	5'-TTA ^{3'}	5'-Tg g ^{3'}	5'-Tg g ^{3'}	5'-Tg g ^{3'}
3'-primer²	231	2nd I	507	59	58	57
	5'-TgC ^{3'}	5'-AAA ^{3'}	5'-TTg ^{3'}	5'-CTC ^{3'}	5'-ggC ^{3'}	5'-CTC ^{3'}
A*	+	+	+			
B*	+	+	+			
Cw*	+	+	+			
DRB1				+	+	
DRB3				+	+	
DRB5				+		
DQB1					+	
DPB1						+

PCR

generated by the control primer pair is 430 base pairs.

¹The nucleotide position for HLA class I genes and the codon for HLA class II genes, in the 2nd or 3rd exon, matching the specificity-determining 3'-end of the primer is given. Nucleotide and codon numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

²The nucleotide position for HLA class I genes and the codon for HLA class II genes, in the 2nd or 3rd exon or the 2nd intron, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide and codon numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

PRODUCT DESCRIPTION

DQ-DR SSP Combi Tray

CONTENT

The primer set contains 5'- and 3'-primers for grouping the DQB1 alleles in to the serological groups DQ2 to DQ9.

The primer set contains 5'- and 3'-primers for grouping the DRB1*0101 to DRB1*1001 alleles into the corresponding serological groups DR1 to DR18 as well as primer pairs for recognizing the DRB3, DRB4 and DRB5 groups of alleles.

Please note that DQB1 amplifications usually are somewhat less pronounced than e.g. DRB and DQA1 amplifications even when using the same DNA preparation and exactly the same experimental procedures.

PLATE LAYOUT

Each test consists of 32 PCR reactions in a 32 well cut PCR plate.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32

Wells 1 to 8 – DQ low resolution primers.

Wells 9 to 31 – DR low resolution primers.

Well 32 – Negative Control.

The 32 well cut PCR plate is marked with ‘DQ-DR’.

Well No. 1 is marked with the Lot No. ‘17H’ in silver/gray ink.

A faint row of numbers is seen between wells 1 and 2 or wells 7 and 8 of the PCR trays. These stem from the manufacture of the trays, and should be disregarded.

The PCR plates are covered with a PCR-compatible foil.

Please note: When removing each 32 well PCR plate, make sure that the remaining plates stay covered. Use a scalpel or a similar instrument to carefully cut the foil between the plates.

INTERPRETATION

Only the DQB1 alleles will be amplified by the 8 wells of the DQ low resolution primer set, **wells 1 to 8**. Thus, the interpretation of DQ low resolution typings is not influenced the DQB2 and DQB3 genes.

Only HLA-DRB alleles will be amplified by the 23 wells of the DR low resolution primer set, **wells 9 to 31**. Thus, the interpretation of DR low resolution typings is not influenced by other HLA class II genes.

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UNIQUELY IDENTIFIED ALLELES

All the DQB1 alleles, i.e. **DQB1*050101 to 0505**, **DQB1*060101 to 0639**, **DQB1*020102 to 0205**, **DQB1*030101 to 0326** and **DQB1*0401 to 0404**, recognized by the HLA Nomenclature Committee in January 2010¹ will be amplified by the primers in the DQ low resolution SSP primer set, **wells 1 to 8**. The DQB1 alleles will be grouped into their corresponding serological specificities, i.e.:

DQ5	=	DQB1*050101-0505 ²
DQ6	=	DQB1*060101-0639 ²
DQ2	=	DQB1*020101-0205
DQ3	=	DQB1*030101-0326 ²
DQ7	=	DQB1*030101-030104, 0304, 0309, 0313, 0316, 0319
DQ8	=	DQB1*030201, 030501, 0307, 0308, 0311, 0318
DQ9	=	DQB1*030302, 0315, 0320
DQ4	=	DQB1*0401-0404

¹DQB1 alleles listed on the IMGT/HLA web page 2010-January-15, release 2.28.0, www.ebi.ac.uk/imgt/hla.

²The serological split of all DQB1 alleles is not known. In this table we use the expert-assigned serological grouping in Tissue Antigens (2009) **73**:95-170 and the serological grouping of the sequence-defined allele. The DQB1*0310 allele has been assigned type DQ7 by NMDP.

All the HLA-DRB1, -DRB3, -DRB4¹ and -DRB5 alleles, i.e. **DRB1*010101 to 1003**, **DRB3*01010201 to DRB3*0303**, **DRB4*01010101 to DRB4*0108**, **DRB5*010101 to DRB5*0205**, recognized by the HLA Nomenclature Committee in January 2010² will be amplified by the primers in the DR low resolution SSP kit. The HLA-DRB alleles will be grouped into their corresponding serological specificities³.

¹The DRB4*0201N and DRB4*0301N null alleles will not be amplified by the DR low resolution primer set.

²DRB alleles listed on the IMGT/HLA web page 2010-January-15, release 2.28.0, www.ebi.ac.uk/imgt/hla.

³The DRB1*0809, DRB1*0821 and DRB1*1415 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1415 allele.

The DRB1*0820, DRB1*1318, DRB1*1347 and DRB1*1355 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1318, DRB1*1347 and DRB1*1355 alleles.

The DRB1*0831 and DRB1*1167 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1167 allele.

The DRB1*1313 and DRB1*1484 alleles yield identical amplification patterns in the DQ-DR low resolution kit. These alleles can be separated by the respective high resolution primer sets.

SPECIFICITY TABLE

DQ low resolution primer set

Specificities and sizes of the PCR products of the 8 primer mixes of the DQ low resolution primer set

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	DQ serology ³	Amplified DQB1 alleles ⁴
1⁵	225 bp	515 bp	5	*050101-0505
2	220 bp, 270 bp	430 bp	1, 5, 6, null	*060101-0639
3	210 bp	430 bp	2	*020101-0205
4⁶	220 bp	515 bp	3, 7	*030101-030104, 0304, 0309, 0310, 0313, 0314, 0316, 0319, 0321, 0322, 0324
5⁶	130 bp	515 bp	6, 8	*030201-030204, 0304 ^w , 030501-030504, 0307, 0308, 0311, 0314 ^w , 0318, 0629
6^{6,7}	135 bp	515 bp	2, 3, 4, 9	*0203, 030302, 030303, 0306, 0312, 0315, 0320, 0325, 0326, 040301, 040302
7⁵	145 bp, 185 bp	515 bp	3, 7, 8, 9	*030101-0326
8⁶	210 bp	430 bp	4	*040101-040301, 0404

¹Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of DQ low resolution SSP subtypings. When the primers in a primer mix can give rise to specific PCR products of more than one length this is indicated if the size difference is 20 base pairs or more. Size differences shorter than 20 base pairs are not given. For high resolution SSP kits the respective lengths of the specific PCR product(s) of the alleles amplified by these primer mixes are given.

Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers.

PCR fragments longer than the control bands may sometimes be observed. Such bands should be disregarded and do not influence the interpretation of the SSP typings.

PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings.

Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherent feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 430 base pairs, for most wells, or a band of 515 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DQ low resolution typing.

In addition, wells number 4, 5, 6 and 7 contain the primer pair giving rise to the longer, 515 bp,

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internal positive control band in order to allow kit identification.

In the presence of a specific amplification the intensity of the control band often decreases.

³The serological reactivity of all DQ alleles is not known. In this table we use the information in the HLA Dictionary 2004 on the www.ebi.ac.uk/imgt/hla web site, the information available at the www.worldmarrow.org web site and the expert-assigned serological grouping in Tissue Antigens (2009) **73**:95-170. The DQB1*0310 allele has been assigned type DQ7 by NMDP.

⁴For several DQB1 alleles only partial second exon nucleotide sequences are available. In these instances it is not known whether some of the primers of the SSP sets are completely matched with the target sequences or not. We assume that unknown sequences in the 5'- and 3'-ends of the second exon of the DQB1 gene are conserved within allelic groups.

⁵Primer mix 1 and 7 may give rise to nonspecific amplifications.

⁶Primer mixes 4, 5, 6 and 8 may yield somewhat less intense specific PCR fragments than the other DQ low resolution primer mixes.

⁷Primer mix 6 may have tendencies of primer oligomer formation.

'w', may be weakly amplified.

SPECIFICITY TABLE

DR low resolution primer set

Specificities and sizes of the PCR products of the 24 primer mixes of the DR low resolution primer set

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	DR serology ³	Amplified HLA-DRB alleles ⁴
9 ^{6,8}	200 bp, 255 bp	515 bp	1	*010101-010205, 0104-0131
10	200 bp	430 bp	103	*0103
11 ⁶	210 bp	430 bp	2, 15	*15010101-1543
12	210 bp	430 bp	16	*160101-160502, 1607-1615
13 ^{5,6,11}	120 bp, 220 bp	430 bp	3, 17, 18, 11	*03010101-0352, 1107, 1153, 1525
14 ^{5,6,11}	80 bp, 210 bp	430 bp	3, 6, 17, 11, 13, 14	*03010101-030108, 0304-0306, 0308-0316, 0318-0320, 0322, 0323, 0325, 0326, 0328, 0330, 0331, 0333, 0334, 0336, 0337, 0343-0348, 0350-0352, 110201-1103, 111101, 111102, 111401, 111402, 1116, 1120, 1121, 1136, 1140, 1141, 1148, 1159, 1163, 116501, 116502, 1168, 1170, 1173, 1176, 1179, 1180, 1183, 1185-1187, 130101-1304, 1308, 1310, 1315-1317, 1319, 1320, 1322-1324, 1327-1329, 1331-1341, 1343, 1345, 1348, 1351-1354, 1357, 1359, 1361, 1363-1366, 1368-1376, 1378-1381, 1383-1385, 1387-1397, 1416, 1419, 1421, 1482, 1495
15 ^{5,6}	85 bp, 210 bp	430 bp	3, 6, 11, 13, 14, 1403, 18	*030201-0303, 0327, 0329, 0338, 1113 ^w , 111302 ^w , 1126, 1134, 1315, 1319, 1326, 1344, 1353, 1357, 1385, 1386, 1402-140302, 140601, 140602, 1409, 1412, 1413, 1417-1421, 1424, 1427, 1429, 1430, 143201 ^w , 143202 ^w , 1433, 1440, 1441, 1447-1449, 1451, 1463, 1465 ^w , 1467, 1477, 1478, 1480, 1481, 1483, 1485, 1489, 1494
16 ^{5,6}	100 bp, 175 bp	430 bp	4	*040101-0489

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17⁶	210 bp, 230 bp	430 bp	7, 13, 14	*07010101-070103, 0703-0717, 1317, 1450
18⁶	170 bp, 215 bp, 250 bp	515 bp	8, 12, 14	*080101-0819, 0821-0839, 1167, 1204, 1216, 1411, 1415, 1468, 1493
19⁵⁻⁷	85 bp, 135 bp, 180 bp	430 bp	3, 9, 11	*0308, 090102-0909, 1107, 1153
20⁸	205 bp	430 bp	10	*100101-1003
21^{5,6}	100 bp, 170 bp	430 bp	3, 8, 11, 14	*0308, 0831, 110101-1170, 1172-1189
22^{5,6}	85 bp, 105 bp	430 bp	12	*0832, 120101-1220
23	210 bp	430 bp	6, 8, 11, 13, 14, 1403	*0820, 110101-110405, 110601, 110602, 110801-111202, 111401-1116, 1118-1121, 1123-1125, 112701-1133, 1135-1151, 115401, 115402, 1156-1166, 1168, 1170, 1172-1181, 1183-1188, 130101-1308, 1310-1316, 1318-1343, 1345-1385, 1387-1397, 140301, 140302, 1412, 1416, 1419, 1421, 1422, 1425, 1427, 1440, 1453, 1463, 1467, 1469, 1474, 1477, 1478, 1484, 1485
24⁶	195 bp, 210 bp	430 bp	6, 8, 11, 12, 13, 14	*080101-080203, 080401-0809, 0811, 0816, 0817, 0820-0822, 0824, 0826, 0828, 0831, 0839, 110101-110602, 1109-111202, 111401-1116, 1120, 1121, 1123-1125, 112701-1130, 1132, 1133, 1135-1141, 1143, 1144, 1146-1151, 115401-1156, 115801-1163, 116501-1170, 1172, 1174-1178, 1180-1188, 120201-120204, 1213, 1215, 1216, 1218-1220, 130101-130201, 130203, 1304-130502, 130701-1309, 131101, 131102, 131401-1324, 1326-1329, 1331, 1332, 1334-1336, 1338-1343, 1345-1355, 1357, 1359, 1361-1365, 1367-1376, 1378-1380, 1383, 1384, 1387, 1391-1393, 1396, 1397, 1415, 1416, 1422, 1424, 1425, 1427, 1437, 1453, 1473
25¹¹	175 bp	430 bp	3, 6, 11, 13, 14, 1403, 17, 18	*03010101-0307, 0309, 031101-0341, 0343-0345, 0347-0352, 0820, 130101-1316, 1318-1342, 1344, 1346-1366, 1368-1397, 1402-140302, 140501-140602, 1409,

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				1412-1414, 1417-1421, 142301, 142303, 1424, 1427, 1429, 1430, 1433, 1436, 1437, 1440-1445, 1447, 1448, 1451, 1456, 1459, 1463-1465, 1467, 1477, 1478, 1480, 1481, 1483-1485, 1489, 1491, 1494-1496
26 ^{5,6,9}	100 bp, 140 bp, 155 bp	430 bp	4, 6, 8,13, 14, 1404	*0462, 0469, 0473, 0808, 1169, 1182, 1345, 140101, 140102, 1404, 140701, 140702, 1410, 1416, 1422, 1425, 1426, 1428, 1431-143202, 1435, 1437-1439, 1449, 1450, 1453-1455, 1457, 1458, 1460-1462, 1468-1471, 1473-1476, 1479, 1482, 1486-1488, 1490, 1493, DRB4*01030102N
27 ^{5,6,8}	110 bp, 135 bp, 170 bp	430 bp	3, 4, 6, 9, 11, 13,14,1404	*0310, 090102-090105, 090201, 090202, 0904-0909, 111301, 111302, 1117, 1152, 1343, 140101-1402, 1404-1411, 1413, 1414, 1416-1418, 1419 ^w , 1420, 1421 ^w , 1422-142303, 1426, 1428-1436, 1438, 1439, 1441, 1443-1452, 1454-1457, 1459-1462, 1464, 1465, 1468, 1470-1476, 1479-1483, 1486-1488, 1490-1496, 1527, 1534
28 ^{5,6,8}	110 bp, 175 bp, 225 bp	430 bp	2, 3, 4, 6, 8, 11,13, 14, 1403, 1404, 16	*0310, 0809, 0820, 0821, 0832, 0835, 111301, 111302, 1117, 1123, 1125, 1131, 1145, 1152, 1155, 1164, 1189, 1313, 1318, 1343, 1345, 1347, 1355, 140101-140103, 140301-140503, 140701-1408, 1410-1412, 1414-1416, 1418, 1422-142303, 1425-1428, 1431-143202, 1434-1436, 1438-1440, 1442-1445, 1449, 1450, 1453-1465, 1467-1479, 1481, 1482, 1484-1493, 1495, 1496, 1521 ^w , 1604 ^w
29 ^{5,6,11}	100 bp, 165 bp, 240 bp	430 bp	52	DRB3*01010201-0114, DRB3*0201-0225, DRB3*030101-0303
30 ¹⁰	215 bp	430 bp	53	DRB4*01010101-0108
31	175 bp	430 bp	51	DRB5*010101-0114, DRB5*0202-0205
32 ¹²	-	-		Negative Control

¹Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of DR low resolution SSP subtypings.

When the primers in a primer mix can give rise to specific PCR products of more than one length this is indicated if the size difference is 20 base pairs or more. Size differences shorter than 20 base pairs are

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not given. For high resolution SSP kits the respective lengths of the specific PCR product(s) of the alleles amplified by these primer mixes are given.

Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers, e.g. the primers in wells 11, 26, 27 and 28.

PCR fragments longer than the control bands may sometimes be observed. Such bands should be disregarded and do not influence the interpretation of the SSP typings.

PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings.

Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherent feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 430 base pairs, for most wells, or a band of 515 base pairs, for some wells.

Well number 9 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DR low resolution typing.

In addition, well number 18 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to allow kit identification.

In the presence of a specific amplification the intensity of the control band often decreases.

³The serological reactivity of all DRB alleles is not known. In this table we use the information in the HLA Dictionary 2004 on the www.ebi.ac.uk/imgt/hla web site, the information available at the www.worldmarrow.org web site and the expert-assigned serological grouping in Tissue Antigens (2009) **73**:95-170.

⁴For several DRB alleles only partial second exon nucleotide sequences are available. In these instances it is not known whether some of the primers of the SSP set are completely matched with the target sequences or not. We assume that unknown sequences in the first hyperpolymorphic region of the second exon of DRB alleles are conserved within allelic groups and that unknown sequences of codons 87 to 92 are identical with the DRB1*0101 consensus sequence.

The DRB1*0809, DRB1*0821 and DRB1*1415 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1415 allele.

The DRB1*0820, DRB1*1318, DRB1*1347 and DRB1*1355 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1318, DRB1*1347 and DRB1*1355 alleles.

The DRB1*0831 and DRB1*1167 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1167 allele.

The DRB1*1313 and DRB1*1484 alleles yield identical amplification patterns in the DQ-DR low resolution kit. These alleles can be separated by the respective high resolution primer sets.

⁵Specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.

⁶Individual alleles can give rise to two differently sized specific PCR fragments in primer mixes 9, 13 to 19, 21, 22, 24 and 26 to 29.

⁷Primer mix 19 may give rise to nonspecific amplifications.

⁸Primer mix 9, 20, 27 and 28 may give rise to primer oligomer formation.

⁹Primer mix 26 has a tendency of primer oligomer formation and also has an intense primer cloud due to the high number of primers present in the primer mix.

¹⁰The DRB4*01030102N allele is amplified by the primer pair in well No. 30, whereas the DRB4*0201N and DRB4*0301N null alleles are not amplified by this primer pair.

¹¹Due to sharing of sequence motifs in codon 38, DRB3*0114 will also be amplified in primer mixes 13, 14 and 25 in addition to primer mix 29.

¹²Primer mix 32 contains a negative control, which will amplify more than 95% of HLA amplicons as well as the amplicons generated by control primer pairs. PCR product sizes range from 75 to 200 base pairs. The PCR product generated by the control primer pair is 430 base pairs.

‘w’, might be weakly amplified.

INTERPRETATION TABLE									
DQ low resolution SSP typing									
Amplification patterns of the DQB1*0501 to DQB1*0403 alleles									
		Well							
		1	2	3	4	5	6	7	8
Length of spec.		225	220	210	220	130	135	145	210
PCR product(s)		270						185	
Length of int.		515	430	430	515	515	515	515	430
pos. control ¹									
5'-primer(s) ²		26 (173)	9 (122)	30 (185)	26 (173)	28 (179)	26 (173)	38 (210)	21 (159)
		5' -ggg 3'	5' -gTT 3'	5' -AAg 3'	5' -TTA 3'	5' -gAC 3'	5' -TCT 3'	5' -gCA 3'	5' -ACC 3'
			26 (173)			28 (179)		48 (240)	
			5' -TTA 3'			5' -gAC 3'		5' -CgC 3'	
			26 (173)					55 (260)	
			5' -TCT 3'					5' -gCC 3'	
								55 (260)	
								5' -gCA 3'	
3'-primer(s) ³		87 (356)	86 (353)	86 (353)	86 (353)	57 (266)	57 (266)	86 (353)	77 (327)
		5' -ggT 3'	5' -ACg 3'	5' -gCT 3'	5' -gCT 3'	5' -Cgg 3'	5' -CgT 3'	5' -gCT 3'	5' -ACg 3'
			86 (353)						
			5' -ACC 3'						
Well No.		1	2	3	4	5	6	7	8
DQB1 allele ⁴	ser. ⁵								
*050101-0505	5	1							
*060101-0628, 0630-0639	1, 5, 6, null		2						
*0629	6		2			5			
*020101-0202, 0204, 0205	2			3					
*0203	2			3			6		
*030101-030104, 0309, 0310, 0313, 0316, 0319, 0321, 0322, 0324	3, 7				4			7	
*030201-030204, 030501- 030504, 0307, 0308, 0311, 0318	8					5		7	
*030302, 030303, 0306, 0312, 0315, 0320, 0325, 0326	3, 9						6	7	
*0304, 0314	3, 7				4	w		7	
*0317, 0323	9							7	
*040101-0402, 0404	4								8
*040301	-						6		8
*040302	-						6		
DQB1 allele ⁴	ser. ⁵								
Well No.		1	2	3	4	5	6	7	8

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 430 base pairs, for most wells, or a band of 515 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DQ low resolution typing.

In addition, wells number 4, 5, 6 and 7 contain the primer pair giving rise to the longer, 515 bp, internal positive control band in order to allow kit identification.

²The codon, and in parenthesis the nucleotide, in the 2nd exon, matching the specificity-determining 3'-end of the primer is given. Codon and nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

³The codon, and in parenthesis the nucleotide, in the 2nd exon, matching the specificity-determining 3'-end of the primer is given. Codon and nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

⁴The sequence of the DQB1*030301 allele has been shown to be identical to DQB1*030302.

⁵The serological reactivity of all DQ alleles is not known. In this table we use the information in the HLA Dictionary 2004 on the www.ebi.ac.uk/imgt/hla web site, the information available at the www.worldmarrow.org web site and the expert-assigned serological grouping in Tissue Antigens (2009) **73**:95-170. The DQB1*0310 allele has been assigned type DQ7 by NMDP. 'w', may be weakly amplified.

INTERPRETATION TABLE													
DR low resolution SSP typing													
Amplification patterns of the DRB1*0101 to DRB1*1003 alleles													
		Well ⁶											
		9	10	11	12	13	14	15	16	17	18	19	20
Length of spec.		200	200	210	210	120	80	85	100	210	170	85	205
PCR product(s)		255				220	210	210	175	230	215	135	
Length of int.		515	430	430	430	430	430	430	430	430	515	430	430
pos. control ¹													
5'-primer(s) ²		14 (129)	14 (129)	13 (126)	13 (126)	13 (125)	13 (125)	13 (125)	13 (125)	14 (127)	16 (133)	26 (165)	31 (178)
		5'-gAA 3'	5'-gAA 3'	5'-A gg 3'	5'-A gg 3'	5'-gTC 3'	5'-gTC 3'	5'-gTC 3'	5'-ACA 3'	5'-ATA 3'	5'-gTT 3'	5'-TAT 3'	5'-gCg 3'
				13 (126)	13 (126)	47 (227)	16 (133)		13 (125)	14 (127)	16 (133)	58 (261)	
				5'-AAg 3'	5'-AAg 3'	5'-gTT 3'	5'-gTT 3'		5'-ACC 3'	5'-ATA 3'	5'-gTT 3'	5'-gAg 3'	
									13 (125)	16 (133)			
									5'-ATA 3'	5'-gTT 3'			
									13 (125)				
									5'-gTC 3'				
3'-primer(s) ³		67 (286)	67 (286)	67 (286)	67 (286)	73 (305)	26 (164)	28 (171)	33 (184)	71 (298)	58 (260)	57 (257)	86 (344)
		5'-gAg 3'	5'-gAT 3'	5'-gAT 3'	5'-gAA 3'	5'-ggC 3'	5'-ggT 3'	5'-CTC 3'	5'-gTg 3'	5'-CTC 3'	5'-CCT 3'	5'-CgA 3'	5'-CAC 3'
		67 (286)		70 (295)	67 (286)	73 (305)	71 (299)	70 (295)	58 (260)	73 (305)	74 (307)	73 (305)	86 (344)
		5'-gAg 3'		5'-CTg 3'	5'-gAg 3'	5'-ggC 3'	5'-gCT 3'	5'-CTg 3'	5'-Cgg 3'	5'-ggC 3'	5'-CAg 3'	5'-ggC 3'	5'-CCA 3'
		67 (286)		71 (298)	72 (303)	74 (308)				77 (317)	86 (344)	78 (319)	
		5'-gAT 3'		5'-CgC 3'	5'-gCg 3'	5'-CCC 3'				5'-AAT 3'	5'-CAC 3'	5'-CAC 3'	
		71 (299)		71 (299)						78 (319)			
		5'-gCg 3'		5'-gCT 3'						5'-CAC 3'			
		86 (344)		73 (305)									
		5'-CCA 3'		5'-ggC 3'									
Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20
DRB1 allele ⁴	ser ⁵												
*010101-010205, 0104-0131	1	9											
*0103	103		10										
*03010101-030108, 0304-0306, 0309, 031101-0316, 0318-0320, 0322, 0323, 0325, 0326, 0328, 0330, 0331, 0333, 0334, 0336, 0337, 0343-0345, 0347, 0348, 0350-0352	3, 17					13	14						
*030201-0303, 0327, 0329, 0338	3, 18					13		15					
*0307, 0317, 0321, 0324, 0332, 0335, 0339-0341, 0349	3					13							
Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20

INTERPRETATION TABLE											
DR low resolution SSP typing											
Amplification patterns of the DRB1*0101 to DRB1*1003 alleles											
Well ⁶											
21	22	23	24	25	26	27	28	29	30	31	32
100	85	210	195	175	100	110	110	100	215	175	Negative control
170	105		210		140	135	175	165			
					155	170	225	240			
430	430	430	430	430	430	430	430	430	430	430	
13	16	10	10	13	1 st I	26	13	10	28	13	
(125)	(133)	(116)	(116)	(125)		(164)	(125)	(116)	(170)	(125)	
5'-gTC 3'	5'-gTT 3'	5'-gCT 3'	5'-gCT 3'	5'-gTC 3'	5'-CAA 3'	5'-gTA 3'	5'-gTC 3'	5'-gCT 3'	5'-gAT 3'	5'-gTA 3'	
16		13	13		37	34	34	10			
(133)		(125)	(125)		(197)	(189)	(189)	(116)			
5'-gTC 3'		5'-gTC 3'	5'-gTC 3'		5'-gTT 3'	5'-CAg 3'	5'-CAg 3'	5'-gCT 3'			
38			16		37			57			
(200)			(133)		(197)			(258)			
5'-CgT 3'			5'-gTT 3'		5'-gTA 3'			5'-gTC 3'			
			16								
			(133)								
			5'-gTC 3'								
58	30	70	67	58	42	57	57	51	87	57	
(260)	(175)	(295)	(286)	(260)	(213)	(257)	(257)	(239)	(346)	(258)	
5'-CCT 3'	5'-gTg 3'	5'-gTC 3'	5'-gAA 3'	5'-Cgg 3'	5'-TCA 3'	5'-CAg 3'	5'-CAg 3'	5'-CCC 3'	5'-CTC 3'	5'-gCg 3'	
58	38	71	71	58	57	70	60	77	87	58	
(260)	(199)	(299)	(298)	(260)	(257)	(295)	(265)	(317)	(346)	(260)	
5'-CCT 3'	5'-CAg 3'	5'-gCT 3'	5'-CgC 3'	5'-CAg 3'	5'-CAg 3'	5'-CTg 3'	5'-gTg 3'	5'-AAT 3'	5'-CTT 3'	5'-CCT 3'	
58			71		71	70	70				
(260)			(298)		(298)	(296)	(296)				
5'-CCT 3'			5'-CTC 3'		5'-CgC 3'	5'-TCC 3'	5'-TCC 3'				
							74				
							(307)				
							5'-CAg 3'				
21	22	23	24	25	26	27	28	29	30	31	32
											DR
											Well No.
											ser ⁵
											DRB1 allele ⁴
											1
											*010101-010205, 0104-0131
											103
											*0103
				25							3, 17
											*03010101-030108, 0304-0306, 0309, 031101-0316, 0318-0320, 0322, 0323, 0325, 0326, 0328, 0330, 0331, 0333, 0334, 0336, 0337, 0343-0345, 0347, 0348, 0350-0352
				25							3, 18
											*030201-0303, 0327, 0329, 0338
				25							3
											*0307, 0317, 0321, 0324, 0332, 0335, 0339-0341, 0349
21	22	23	24	25	26	27	28	29	30	31	32
											DR
											Well No.

Lot No.: **17H**

Lot-specific information

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Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20
DRB1 allele⁴	ser⁵												
*0308	3					13	14					19	
*0310	3					13	14						
*0342	-					13							
*0346	-					13	14						
*040101-0461, 0463-0468, 0470-047202, 0474-0489	4								16				
*0462, 0469, 0473	4								16				
*07010101-070103, 0703-0717	7, null									17			
*080101-080203, 080401-0807, 0811, 0816, 0817, 0822, 0824, 0826, 0828, 0839	8										18		
*080302, 0810, 0812-0815, 0818, 0819, 0823, 0825, 0827, 0829-083002, 0833, 0834, 0836-0838	8										18		
*0808	8										18		
*0809, 0821, 1415	8										18		
*0820, 1318, 1347, 1355	-, 13												
*0831, 1167	8, 11										18		
*0832	-										18		
*0835	-										18		
*090102-090105, 090201, 090202, 0904-0909	9											19	
*090106, 0903	9											19	
*100101-1003	10												20
*110101-110111, 110401-110405, 110601, 110602, 1109-111002, 111201, 111202, 1115, 1124, 112701-1130, 1132, 1133, 1135, 1137-1139, 1143, 1144, 1146, 1147, 1149-1151, 115401, 115402, 1156, 115801, 115802, 1160-1162, 1166, 1172, 1174, 1175, 1177, 1178, 1181, 1184, 1188	11												
Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20

Lot No.: **17H**

Lot-specific information

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21	22	23	24	25	26	27	28	29	30	31	32	DR	Well No.
												ser ⁵	DRB1 allele ⁴
21												3	*0308
						27	28					3	*0310
												-	*0342
												-	*0346
												4	*040101-0461, 0463-0468, 0470-047202, 0474-0489
					26							4	*0462, 0469, 0473
												7, null	*07010101-070103, 0703-0717
			24									8	*080101-080203, 080401-0807, 0811, 0816, 0817, 0822, 0824, 0826, 0828, 0839
												8	*080302, 0810, 0812-0815, 0818, 0819, 0823, 0825, 0827, 0829-083002, 0833, 0834, 0836-0838
			24		26							8	*0808
			24				28					8	*0809, 0821, 1415
		23	24	25			28					-, 13	*0820, 1318, 1347, 1355
21			24									8, 11	*0831, 1167
	22						28					-	*0832
							28					-	*0835
						27						9	*090102-090105, 090201, 090202, 0904-0909
												9	*090106, 0903
												10	*100101-1003
21		23	24									11	*110101-110111, 110401-110405, 110601, 110602, 1109-111002, 111201, 111202, 1115, 1124, 112701-1130, 1132, 1133, 1135, 1137-1139, 1143, 1144, 1146, 1147, 1149-1151, 115401, 115402, 1156, 115801, 115802, 1160-1162, 1166, 1172, 1174, 1175, 1177, 1178, 1181, 1184, 1188
21	22	23	24	25	26	27	28	29	30	31	32	DR	Well No.

Negative control

Lot No.: **17H**

Lot-specific information

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Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20
DRB1 allele⁴	ser⁵												
*110201-1103, 111101, 111102, 111401, 111402, 1116, 1120, 1121, 1136, 1140, 1141, 1148, 1159, 1163, 116501, 116502, 1168, 1170, 1176, 1180, 1183, 1185-1187	11, 13						14						
*1105	11												
*1107, 1153	11					13						19	
*110801, 110802, 1118- 111902, 1142, 1157	11												
*111301, 111302	11							w					
*1117, 1152	11, 14												
*1122	-												
*1123, 1125	11												
*1126, 1134	11							15					
*1131, 1145, 1164	11												
*1155	11												
*1169, 1182	-												
*1173, 1179	-						14						
*1189	-												
*120101-120103, 120302, 1205-1212, 1214, 1217	12												
*120201-120204, 1213, 1215, 1218-1220	12												
*1204	12										18		
*1216	-										18		
*130101-130201, 130203, 1304, 1308, 1316, 1320, 1322-1324, 1327-1329, 1331, 1332, 1334-1336, 1338-1341, 1348, 1351, 1352, 1354, 1359, 1361, 1363-1365, 1368-1376, 1378-1380, 1383, 1384, 1387, 1391- 1393, 1396, 1397	13						14						
*130202, 130301- 130304, 1310, 133301- 133303, 1337, 1366, 1381, 1388-1390, 1394, 1395	13						14						
Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20

Lot No.: **17H**

Lot-specific information

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21	22	23	24	25	26	27	28	29	30	31	32	DR ser ⁵	Well No. DRB1 allele ⁴
21		23	24										*110201-1103, 111101, 111102, 111401, 111402, 1116, 1120, 11, 1121, 1136, 1140, 1141, 13 1148, 1159, 1163, 116501, 116502, 1168, 1170, 1176, 1180, 1183, 1185-1187
21			24									11	*1105
21												11	*1107, 1153
21		23										11	*110801, 110802, 1118-111902, 1142, 1157
21						27	28					11	*111301, 111302
21						27	28					11, 14	*1117, 1152
21												-	*1122
21		23	24				28					11	*1123, 1125
21												11	*1126, 1134
21		23					28					11	*1131, 1145, 1164
21			24				28					11	*1155
21			24		26							-	*1169, 1182
21		23										-	*1173, 1179
21							28					-	*1189
	22											12	*120101-120103, 120302, 1205-1212, 1214, 1217
	22		24									12	*120201-120204, 1213, 1215, 1218-1220
	22											12	*1204
	22		24									-	*1216
		23	24	25								13	*130101-130201, 130203, 1304, 1308, 1316, 1320, 1322-1324, 1327-1329, 1331, 1332, 1334-1336, 1338-1341, 1348, 1351, 1352, 1354, 1359, 1361, 1363-1365, 1368-1376, 1378-1380, 1383, 1384, 1387, 1391-1393, 1396, 1397
		23		25								13	*130202, 130301-130304, 1310, 133301-133303, 1337, 1366, 1381, 1388-1390, 1394, 1395
21	22	23	24	25	26	27	28	29	30	31	32	DR	Well No.

Negative control

Lot No.: **17H**

Lot-specific information

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Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20
DRB1 allele⁴	ser⁵												
*130501, 130502, 130701, 130702, 131101, 131102, 131401- 131403, 132101, 132102, 1342, 1346, 1349-135002, 1362	6, 11, 13												
*1306, 1312, 1325, 1330, 1356, 1358, 1360, 1377, 1382	6, 13												
*1309	13												
*1313, 1484	13, -												
*1315, 1319, 1353, 1357	13						14	15					
*1317	13						14			17			
*1326	14							15					
*1343	13						14						
*1344, 1386	-							15					
*1345	13						14						
*1367	13												
*1385	-						14	15					
*140101, 140102, 1404, 140701, 140702, 1410, 1426, 1428, 1431, 1435, 1438, 1439, 1454, 1455, 1457, 1460-1462, 1470, 1471, 1475, 1476, 1479, 1486-1488, 1490	4/6, 14, 1404												
*140103, 1408, 142302, 1434, 1472, 1492N	14, null												
*1402, 140601, 140602, 1409, 1413, 1417, 1420, 1429, 1430, 1433, 1441, 1447, 1448, 1451, 1480, 1483, 1494	6, 14							15					
*140301, 140302, 1412, 1440, 1463, 1467, 1477, 1478, 1485	6, 14, 1403							15					
*140501-140503, 1414, 142301, 142303, 1436, 1443-1445, 1456, 1459, 1464, 1491, 1496	14												
*1411	14										18		
*1416	6						14						
*1418, 1481	14							15					
*1419, 1421	14						14	15					
*1422	14												
*1424	14							15					
*1425, 1453	6, 13/14												
Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20

Lot No.: **17H**

Lot-specific information

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21	22	23	24	25	26	27	28	29	30	31	32	DR	Well No.
												ser ⁵	DRB1 allele ⁴
		23	24	25								6, 11, 13	*130501, 130502, 130701, 130702, 131101, 131102, 131401-131403, 132101, 132102, 1342, 1346, 1349-135002, 1362
		23		25								6, 13	*1306, 1312, 1325, 1330, 1356, 1358, 1360, 1377, 1382
			24	25								13	*1309
		23		25			28					13, -	*1313, 1484
		23	24	25								13	*1315, 1319, 1353, 1357
			24									13	*1317
		23	24	25								14	*1326
		23	24			27	28					13	*1343
				25								-	*1344, 1386
		23	24		26		28					13	*1345
		23	24									13	*1367
		23		25								-	*1385
						26	27	28				4/6, 14, 1404	*140101, 140102, 1404, 140701, 140702, 1410, 1426, 1428, 1431, 1435, 1438, 1439, 1454, 1455, 1457, 1460-1462, 1470, 1471, 1475, 1476, 1479, 1486-1488, 1490
						27	28					14, null	*140103, 1408, 142302, 1434, 1472, 1492N
				25		27						6, 14	*1402, 140601, 140602, 1409, 1413, 1417, 1420, 1429, 1430, 1433, 1441, 1447, 1448, 1451, 1480, 1483, 1494
		23		25			28					6, 14, 1403	*140301, 140302, 1412, 1440, 1463, 1467, 1477, 1478, 1485
				25		27	28					14	*140501-140503, 1414, 142301, 142303, 1436, 1443-1445, 1456, 1459, 1464, 1491, 1496
						27	28					14	*1411
		23	24		26	27	28					6	*1416
				25		27	28					14	*1418, 1481
		23		25		w						14	*1419, 1421
		23	24		26	27	28					14	*1422
			24	25								14	*1424
		23	24		26		28					6, 13/14	*1425, 1453
21	22	23	24	25	26	27	28	29	30	31	32	DR	Well No.

Negative control

Lot No.: **17H**

Lot-specific information

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Well No.	DR	9	10	11	12	13	14	15	16	17	18	19	20
DRB1 allele ⁴	ser ⁵												
*1427	14							15					
*143201, 143202	14							w					
*1437	14												
*1442	-												
*1446, 1452	14												
*1449	14							15					
*1450	14									17			
*1458	14												
*1465	6							w					
*1468, 1493	14										18		
*1469	-												
*1473	-												
*1474	-												
*1482	-						14						
*1489	-							15					
*1495	-						14						
*15010101-1520, 1522-1524, 1526, 1528-1533, 1535-1543	2, 15, null			11									
*1521	2			11									
*1525	-			11		13							
*1527, 1534	-			11									
*160101-1603, 160501, 160502, 1607-1615	16				12								
*1604	16				12								
DRB3*01010201-0114, DRB3*0201-0225, DRB3*030101-0303	52												
DRB4*01010101-01030101, 010302-0108	53, null												
DRB4*01030102N	null												
DRB5*010101-0114, DRB5*0202-0205	51, null												
Well No.	ser ⁵	9	10	11	12	13	14	15	16	17	18	19	20

Lot No.: **17H**

Lot-specific information

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21	22	23	24	25	26	27	28	29	30	31	32	DR	Well No.
												ser ⁵	DRB1 allele ⁴
		23	24	25			28					14	*1427
					26	27	28					14	*143201, 143202
			24	25	26							14	*1437
				25			28					-	*1442
						27						14	*1446, 1452
					26	27	28					14	*1449
					26	27	28					14	*1450
					26		28					14	*1458
				25		27	28					6	*1465
					26	27	28					14	*1468, 1493
		23			26		28					-	*1469
			24		26	27	28					-	*1473
		23			26	27	28					-	*1474
					26	27	28					-	*1482
				25			28					-	*1489
				25		27	28					-	*1495
												2, 15, null	*15010101-1520, 1522-1524, 1526, 1528-1533, 1535-1543
							w					2	*1521
												-	*1525
						27						-	*1527, 1534
												16	*160101-1603, 160501, 160502, 1607-1615
							w					16	*1604
								29				52	DRB3*01010201-0114, DRB3*0201-0225, DRB3*030101-0303
									30			53, null	DRB4*01010101-01030101, 010302-0108
					26				30			null	DRB4*01030102N
										31		51, null	DRB5*010101-0114, DRB5*0202-0205
21	22	23	24	25	26	27	28	29	30	31	32	DR	Well No.
												ser ⁵	Well No.

Negative control

Lot No.: **17H**

Lot-specific information

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¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 430 base pairs, for most wells, or a band of 515 base pairs, for some wells.

Well number 9 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DR low resolution typing.

In addition, well number 18 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to allow kit identification.

²The codon, and in parenthesis the nucleotide, in the 2nd exon, matching the specificity-determining 3'-end of the primer is given. Codon and nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

³The codon, and in parenthesis the nucleotide, in the 2nd exon, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Codon and nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

⁴The sequence of the DRB1*0702 allele has been shown to be identical to DRB1*070101.

The sequence of the DRB1*080301 allele has been shown to be identical to DRB1*080302.

The sequence of the DRB1*090101 allele has been shown to be identical to DRB1*090102.

The sequence of the DRB1*1171 allele has been shown to be identical to DRB1*110201.

The sequence of the DRB1*120301 allele has been shown to be identical to DRB1*1201.

The DRB1*1466 allele has been renamed DRB1*143202.

The sequence of the DRB1*1606 allele has been shown to be identical to DRB1*160501.

The sequence of the DRB3*010101 allele has been shown to be identical to DRB3*01010201.

The DRB4*0101102N allele has been renamed DRB4*0103102N.

The sequence of the DRB5*0201 allele has been shown to be identical to DRB5*0202.

The DRB1*0809, DRB1*0821 and DRB1*1415 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1415 allele.

The DRB1*0820, DRB1*1318, DRB1*1347 and DRB1*1355 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1318, DRB1*1347 and DRB1*1355 alleles.

The DRB1*0831 and DRB1*1167 alleles yield identical amplification patterns except for the specific PCR product yielded by the DRB3 gene in linkage disequilibrium with the DRB1*1167 allele.

The DRB1*1313 and DRB1*1484 alleles yield identical amplification patterns in the DQ-DR kit. These alleles can be separated by the respective high resolution primer sets.

Due to sharing of sequence motifs in codon 38, DRB3*0114 will also be amplified in primer mixes 13, 14 and 25 in addition to primer mix 29.

⁵The serological reactivity of all DRB alleles is not known. In this table we use the information in the HLA Dictionary 2004 on the www.ebi.ac.uk/imgt/hla web site, the information available at the www.worldmarrow.org web site and the expert-assigned serological grouping in Tissue Antigens (2009) **73**:95-170.

⁶Primer mix 32 contains a negative control, which will amplify more than 95% of HLA amplicons as well as the amplicons generated by control primer pairs. PCR product sizes range from 75 to 200 base pairs. The PCR product generated by the control primer pair is 430 base pairs.

'ser', serological HLA specificity.

'w', may be weakly amplified.

Lot No.: **17H**

Lot-specific information

www.olerup-ssp.com

CELL LINE VALIDATION SHEET												
DQ low resolution primer set												
				Well								
				1	2	3	4	5	6	7	8	
				Production No.	200966601	200966602	200966603	200966604	200966605	200966606	200966607	200966608
IHWC cell line		DQB1										
1	9001	SA	*0501		+	-	-	-	-	-	-	-
2	9280	LK707	*0601	*0202	-	+	+	-	-	-	-	-
3	9011	E4181324	*0601		-	+	-	-	-	-	-	-
4	9275	GU373	*0201		-	-	+	-	-	-	-	-
5	9009	KAS011	*0502		+	-	-	-	-	-	-	-
6	9353	SM	*0302	*0601	-	+	-	-	+	-	+	-
7	9020	QBL	*0201		-	-	+	-	-	-	-	-
8	9025	DEU	*0301		-	-	-	+	-	-	+	-
9	9026	YAR	*0302		-	-	-	-	+	-	+	-
10	9107	LKT3	*0401		-	-	-	-	-	-	-	+
11	9051	PITOUT	*0202		-	-	+	-	-	-	-	-
12	9052	DBB	*0303		-	-	-	-	-	+	+	-
13	9004	JESTHOM	*0501		+	-	-	-	-	-	-	-
14	9071	OLGA	*0402		-	-	-	-	-	-	-	+
15	9075	DKB	*0303		-	-	-	-	-	+	+	-
16	9037	SWEIG007	*0301		-	-	-	+	-	-	+	-
17	9282	CTM3953540	*0201	*0603	-	+	+	-	-	-	-	-
18	9257	32367	*0602	*0202	-	+	+	-	-	-	-	-
19	9038	BM16	*0301		-	-	-	+	-	-	+	-
20	9059	SLE005	*0604		-	+	-	-	-	-	-	-
21	9064	AMALA	*0301		-	-	-	+	-	-	+	-
22	9056	KOSE	*0503	*0604	+	+	-	-	-	-	-	-
23	9124	IHL	*0503	*0601	+	+	-	-	-	-	-	-
24	9035	JBUSH	*0301		-	-	-	+	-	-	+	-
25	9049	IBW9	*0202		-	-	+	-	-	-	-	-
26	9285	WT49	*0201		-	-	+	-	-	-	-	-
27	9191	CH1007	*0401	*0501	+	-	-	-	-	-	-	+
28	9320	BEL5GB	*0202	*0301	-	-	+	-	-	-	+	-
29	9050	MOU	*0202		-	-	+	-	-	-	-	-
30	9021	RSH	*0402		-	-	-	-	-	-	-	+
31	9019	DUCAF	*0201		-	-	+	-	-	-	-	-
32	9297	HAG	*0301		-	-	-	+	-	-	+	-
33	9098	MT14B	*0302		-	-	-	-	+	-	+	-
34	9104	DHIF	*0301		-	-	-	+	-	-	+	-
35	9302	SSTO	*0305		-	-	-	-	+	-	+	-
36	9024	KT17	*0302		-	-	-	-	+	-	+	-
37	9065	HHKB	*0603		-	+	-	-	-	-	-	-
38	9099	LZL	*0301		-	-	-	+	-	-	+	-
39	9315	CML	*0201	*0301	-	-	+	+	-	-	+	-
40	9134	WHONP199	*0202	*0303	-	-	+	-	-	+	+	-
41	9055	H0301	*0609		-	+	-	-	-	-	-	-
42	9066	TAB089	*0601		-	+	-	-	-	-	-	-
43	9076	T7526	*0303		-	-	-	-	-	+	+	-
44	9057	TEM	*0503		+	-	-	-	-	-	-	-
45	9239	SHJO	*0202		-	-	+	+	-	-	-	-
46	9013	SCHU	*0602		-	+	-	-	-	-	-	-
47	9045	TUBO	*0301		-	-	-	-	-	-	+	-
48	9303	TER-ND	*0501		+	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																				
DR low resolution primer set																				
				Well																
				9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
				Prod. No.:	201068901	201068902	201068903	201068904	201068905	201068906	201068907	201068908	201068909	201068910	201068911	201068912	201068913	201068914	201068915	201068916
IHCW cell line			DRB1																	
1	9001	SA	*0101		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	9280	LK707	*1502	*0405	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	
3	9011	E4181324	*1502		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	
4	9275	GU373	*0301		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	
5	9009	KAS011	*1601		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	
6	9353	SM	*0407	*0803	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	
7	9020	QBL	*0301		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	
8	9025	DEU	*0401		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
9	9026	YAR	*0402		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
10	9107	LKT3	*0405		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
11	9051	PITOUT	*0701		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	
12	9052	DBB	*0701		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	
13	9004	JESTHOM	*0101		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14	9071	OLGA	*0802		-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	
15	9075	DKB	*0901		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
16	9037	SWEIG007	*1101		-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	
17	9282	CTM3953540	*0301	*1301	-	-	-	-	+	+	-	-	-	-	-	-	-	+	+	
18	9257	32367	*0901	*1101	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	
19	9038	BM16	*1201		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
20	9059	SLE005	*1302		-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	
21	9064	AMALA	*1402		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	
22	9056	KOSE	*1302	*1401	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	
23	9124	IHL	*0803	*1414	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
24	9035	JBUSH	*1101		-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	
25	9049	IBW9	*0701		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	
26	9285	WT49	*0301		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	
27	9191	CH1007	*0405	*1001	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	
28	9320	BEL5GB	*0416	*0701	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	
29	9050	MOU	*0701		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	
30	9021	RSH	*0302		-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	
31	9019	DUCAF	*0301		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	
32	9297	HAG	*1303		-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	
33	9098	MT14B	*0404		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
34	9104	DHIF	*1101		-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	
35	9302	SSTO	*0403		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
36	9024	KT17	*0403	*0406	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
37	9065	HHKB	*1301		-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	
38	9099	LZL	*1402		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	
39	9315	CML	*0301	*0401	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	
40	9134	WHONP199	*0701	*0901	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	
41	9055	H0301	*1302		-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	
42	9066	TAB089	*0803		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
43	9076	T7526	*0901		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
44	9057	TEM	*1401		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
45	9239	SHJO	*0701		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	
46	9013	SCHU	*1501		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	
47	9045	TUBO	*1104	*1201	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	
48	9303	TER-ND	*0103		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	

Lot No.: **17H**

Lot-specific information

www.olerup-ssp.com

CELL LINE VALIDATION SHEET											
DR low resolution primer set											
				Prod. No.:	Well						
					25	26	27	28	29	30	31
					201068917	201068918	201068919	201068920	201068921	201068922	201068923
	IHWC cell line		DRB1								
1	9001 SA		*0101		-	-	-	-	-	-	-
2	9280 LK707		*1502	*0405	-	-	-	-	-	+	+
3	9011 E4181324		*1502		-	-	-	-	-	-	+
4	9275 GU373		*0301		+	-	-	-	+	-	-
5	9009 KAS011		*1601		-	-	-	-	-	-	+
6	9353 SM		*0407	*0803	-	-	-	-	-	+	-
7	9020 QBL		*0301		+	-	-	-	+	-	-
8	9025 DEU		*0401		-	-	-	-	-	+	-
9	9026 YAR		*0402		-	-	-	-	-	+	-
10	9107 LKT3		*0405		-	-	-	-	-	+	-
11	9051 PITOUT		*0701		-	-	-	-	-	+	-
12	9052 DBB		*0701		-	-	-	-	-	+	-
13	9004 JESTHOM		*0101		-	-	-	-	-	-	-
14	9071 OLGA		*0802		-	-	-	-	-	-	-
15	9075 DKB		*0901		-	-	+	-	-	+	-
16	9037 SWEIG007		*1101		-	-	-	-	+	-	-
17	9282 CTM3953540		*0301	*1301	+	-	-	-	-	-	-
18	9257 32367		*0901	*1101	-	-	-	-	+	+	-
19	9038 BM16		*1201		-	-	-	-	+	-	-
20	9059 SLE005		*1302		+	-	-	-	+	-	-
21	9064 AMALA		*1402		+	-	+	-	+	-	-
22	9056 KOSE		*1302	*1401	+	+	+	+	+	-	-
23	9124 IHL		*0803	*1414	+	-	+	+	+	-	-
24	9035 JBUSH		*1101		-	-	-	-	+	-	-
25	9049 IBW9		*0701		-	-	-	-	-	+	-
26	9285 WT49		*0301		+	-	-	-	+	-	-
27	9191 CH1007		*0405	*1001	-	-	-	-	-	+	-
28	9320 BEL5GB		*0416	*0701	-	-	-	-	-	+	-
29	9050 MOU		*0701		-	-	-	-	-	+	-
30	9021 RSH		*0302		+	-	-	-	+	-	-
31	9019 DUCAF		*0301		+	-	-	-	+	-	-
32	9297 HAG		*1303		+	-	-	-	+	-	-
33	9098 MT14B		*0404		-	-	-	-	-	+	-
34	9104 DHIF		*1101		-	-	-	-	+	-	-
35	9302 SSTO		*0403		-	-	-	-	-	+	-
36	9024 KT17		*0403	*0406	-	-	-	-	-	+	-
37	9065 HHKB		*1301		+	-	-	-	+	-	-
38	9099 LZL		*1402		+	-	+	-	+	-	-
39	9315 CML		*0301	*0401	+	-	-	-	+	+	-
40	9134 WHONP199		*0701	*0901	-	-	-	-	-	+	-
41	9055 H0301		*1302		+	-	-	-	+	-	-
42	9066 TAB089		*0803		-	-	-	-	-	-	-
43	9076 T7526		*0901		-	-	+	-	-	+	-
44	9057 TEM		*1401		-	+	+	+	+	-	-
45	9239 SHJO		*0701		-	-	-	-	-	+	-
46	9013 SCHU		*1501		-	-	-	-	-	-	+
47	9045 TUBO		*1104	*1201	-	-	-	-	+	-	-
48	9303 TER-ND		*0103		-	-	-	-	-	-	-

CERTIFICATE OF ANALYSIS

Olerup SSP® DQ-DR SSP Combi Tray

Product number: 101.704-48u/12u – without Taq pol.
Lot number: 17H
Expiry date: 2012-April-01
Number of tests: 48 tests – Product No. 101.704-48u
12 tests – Product No. 101.704-12u
Number of wells per test: 31 + 1

Well specifications:

Well No.	Production No.
1	2009-666-01
2	2009-666-02
3	2009-666-03
4	2009-666-04
5	2009-666-05
6	2009-666-06
7	2009-666-07
8	2009-666-08

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
9	2010-689-01	17	2010-689-09	25	2010-689-17
10	2010-689-02	18	2010-689-10	26	2010-689-18
11	2010-689-03	19	2010-689-11	27	2010-689-19
12	2010-689-04	20	2010-689-12	28	2010-689-20
13	2010-689-05	21	2010-689-13	29	2010-689-21
14	2010-689-06	22	2010-689-14	30	2010-689-22
15	2010-689-07	23	2010-689-15	31	2010-689-23
16	2010-689-08	24	2010-689-16		

The specificity of each primer solution of the kit has been tested against 48 well characterized IHWC cell line DNAs.

The reactivities of one additional 5'-primer and one or more 3'-primers in primer solution 17, 19 and 26 were tested by separately adding another 5'-primer or 3'-primer.

One or more additional 3'-primers in primer solution 9, 11, 18, 20 and 28 were tested by separately adding another 5'-primer.

One additional 5'-primer in primer solutions 2, 14, 23, 24 and 29 was tested by separately adding another 3'-primer.

In primer solutions 9, 11, 21 and 30 one or more 3'-primers were not possible to test, and in primer solutions 11, 12, 16 to 18, 21 and 24 one or more 5'-primers were not possible to test.

The negative control primer pairs, **Production No. 2009-614-01**, can detect contamination with PCR products diluted 10^{-7} .

Lot No.: **17H**

Lot-specific information

www.olerup-ssp.com

Results: No false positive or false negative amplifications were obtained.

Date of approval: 2011-April-15

Approved by:

Quality Control Supervisor

Lot No.: **17H**

Lot-specific information

www.olerup-ssp.com

Declaration of Conformity

Product name: *Olerup* SSP® DQ-DR SSP Combi Tray
Product number: 101.704-48u/12u
Lot number: 17H

Intended use: DQB1 and DRB1 low resolution histocompatibility testing

Manufacturer: *Olerup* SSP AB
Hasselstigen 1
SE-133 33 Saltsjöbaden, Sweden
Phone: +46-8-717 88 27
Fax: +46-8-717 88 18

We, *Olerup* SSP AB, hereby declare that this product, to which this Declaration of Conformity relates is in conformity with the following Standard(s) and other normative document(s) ISO 9001:2008 and ISO 13485:2003, following the provisions of the 98/79/EC Directive on *in vitro* diagnostic medical devices, Annex II List B, conformity assessed using Annex IV, as transposed into the national laws of the Member States of the European Union.

The Technical Documentation File is maintained at *Olerup* SSP AB, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.

The Authorized Representative located within the Community is: *Olerup* SSP AB.

Notified Body: Lloyd's Register Quality Assurance Limited, Hiramford, Middlemarch Office Village, Siskin Drive, Coventry CV3 4FJ, United Kingdom. (Notified Body number: 0088.)

Saltsjöbaden, Sweden
2011-April-15

Olle Olerup
Managing Director

Lot No.: **17H**

Lot-specific information

www.olerup-ssp.com

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Web page: <http://www.olerup.com>

Olerup Inc., 901 S. Bolmar St., Suite R, West Chester, PA 19382

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For information on *Olerup* SSP distributors worldwide, contact **Olerup GmbH**.