

Olerup SSP® HLA-A-B-DR-DQ SSP Combi Tray

Product number:	101.708-24u – without <i>Taq</i> pol.
Lot number:	65K
Expiry date:	2013-June-01
Number of tests:	24 tests
Number of wells per test:	95 +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. 65K.

CHANGES COMPARED TO THE PREVIOUS *OLERUP SSP®* HLA-A-B-DR-DQ SSP COMBI TRAY LOT

The **HLA-A low resolution** specificity and interpretation tables have been updated for the HLA-A alleles described since the previous *Olerup SSP®* HLA-A-B-DR-DQ SSP Combi Tray lot was made (**Lot No. 30G**).

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

Well	5'-primer	3'-primer	rationale
1	-	Added	Primer added for the A*01:69 allele.
2	Exchanged	-	Improved allelic resolution, exchanged positive control primer pair.
9	Added	-	Primer added for the A*26:31 allele.
10	Added	-	Primer added for the A*66:11 allele.
13	Added	Added	Primer pairs added for the A*03:95 and A*26:19 alleles.
15	Added	Added	Primer pairs added for the A*03:95 and A*31:44 alleles.
16	Added	Exchanged, added	Exchanged 3'-primer and primer pair added for the A*03:82 and A*31:35 alleles.
19	Exchanged	Added	Exchanged 5'-primer and 3'-primer added for the A*68:50 allele.

The **HLA-B low resolution** specificity and interpretation tables have been updated for the HLA-B alleles described since the previous *Olerup SSP®* HLA-A-B-DR-DQ SSP Combi Tray lot was made (**Lot No. 30G**).

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

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Well	5'-primer	3'-primer	rationale
27	Added	Added	Improved allelic resolution of B*13 and B*44 alleles.
30	-	Added	Primer added for the B*78:07 allele.
31	Moved	Moved	Primer pair moved to well 34 for increased specificity.
34	Added	Added	Primer pair from well 31.
35	-	Added	3'-primers added for the B*18:01:09 and B*18:48 alleles.
39	Added	-	Primer pair added for the B*82:03 allele.
44	-	Added	3'-primer added for the B*40:110 allele.
45	Added	-	5'-primer added for the B*40:137 allele.
47	-	Added	Improved allelic resolution of B*39 alleles.
56	-	Added	Primer added for the B*52:18 allele.
57	Exchanged	-	Improved allelic resolution.
60	Exchanged	-	Improved allelic resolution.

The **HLA-DR low resolution** specificity and interpretation tables have been updated for the HLA-DRB alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ SSP Combi Tray lot was made (**Lot No. 30G**).

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

Well	5'-primer	3'-primer	rationale
65	-	Added	Primer added for the DRB1*01:33N allele.
67		Exchanged	Improved allelic resolution.
68	-	Exchanged	Improved allelic resolution.
79	Added	-	Primer added for the DRB1*13:103 allele.
80	Added	-	Primer added for the DRB1*13:103 allele.
82	Added	Added	Primer added for the DRB4*01:03:01:02N allele.
85	Exchanged	-	Improved allelic resolution.
86	-	Added	Primer added for the DRB4*01:08 allele.

The **DQ low resolution** specificity and interpretation tables have been updated for the HLA-DQB1 alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ SSP Combi Tray lot was made (**Lot No. 30G**).

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

Well	5'-primer	3'-primer	rationale
91	Removed, added	Removed, added	Primer pair from well 92.
92	Exchanged	Exchanged	Improved resolution of the DQ7, DQ8 and DQ9 specificities.
93	-	Exchanged	Improved resolution of the DQ7, DQ8 and DQ9 specificities.
95	Added	-	Primer added for the DQB1*04:03:02 allele.

Change in revision R01 compared to R00:

1. Primer mix 39 does not amplify the B*15:101 allele. This has been corrected in the Specificity and Interpretation tables.

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Well 96 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 PCR product generated by the control primer pair is 430 base pairs.

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'-Tgg ^{3'}	5'-Tgg ^{3'}	5'-Tgg ^{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*	+	+	+			
C*	+	+	+			
DRB1				+	+	
DRB3				+	+	
DRB5				+		
DQB1					+	
DPB1						+

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

HLA-A-B-DR-DQ SSP Combi Tray

CONTENT

The primer set contains 5'- and 3'-primers for grouping the HLA-A*01:01 to A*80:02 alleles into the corresponding serological groups A1 to A80.

The primer set contains 5'- and 3'-primers for grouping the B*07:02 to B*83:01 alleles into the corresponding serological groups B7 to B81 as well as primer pairs for recognizing the Bw4 and Bw6 sequence motifs.

The primer set contains 5'- and 3'-primers for grouping the DRB1*01:01 to DRB1*10:03 alleles into the corresponding serological groups DR1 to DR18 as well as primer pairs for recognizing the DRB3, DRB4 and DRB5 groups of alleles.

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

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 96 PCR reactions in a 96 well 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
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	ctrl

Wells 1 to 21 – HLA-A low resolution primers.

Wells 22 to 64 – HLA-B low resolution primers.

Wells 65 to 87 – HLA-DR low resolution primers.

Wells 88 to 95 – HLA-DQ low resolution primers.

Well 96 – Negative Control.

The 96 well PCR plate is marked with 'A-B-DR-DQ' in silver/gray ink.

Well No. 1 is marked with the Lot No. '65K'.

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.

INTERPRETATION

Only HLA-A alleles will be amplified by the 21 wells of the HLA-A low resolution primer set, **wells 1 to 21**, except that primer mix 5 will amplify the B*18:27 allele. Thus, the interpretation of HLA-A low resolution is only influenced by this HLA-B allele and not by other HLA Class I genes.

Only HLA-B alleles will be amplified by the 43 wells of the HLA-B low resolution, primer set, **wells 22 to 64**, except that the HLA-C*03:05,03:25 and 03:27 alleles will be amplified by primer mix 24, the C*01:30 allele will be amplified by primer mix 25, the A*23:31, A*24:106 and C*16:10 alleles will be amplified by primer mix 27, the C*07:46 allele will be amplified by primer mix 29, the C*03:102 allele will be amplified by primer mix 37, the C*15:25 allele will be amplified by primer mix 48, the C*15:39 allele will be amplified by primer mix 49, the C*15:02:04 allele will be amplified by primer mix 58, the C*03:12, C*03:19 and C*03:102 alleles will be amplified by primer mix 59 and the A*68:56, C*06:20 and C*12:50 alleles will be amplified by primer mix 62. Thus, the interpretation of HLA-B low resolution typings is only influenced by these three HLA-A alleles and fourteen HLA-C alleles and not by other HLA class I genes.

Only HLA-DRB alleles will be amplified by the 23 wells the DR low resolution primer set, **wells 65 to 87**. Thus, the interpretation of DR low resolution typings is not influenced by other HLA class II genes.

Only the DQB1 alleles will be amplified by the 8 wells the DQ low resolution primer set, **wells 88 to 95**. Thus, the interpretation of DQ low resolution typings is not influenced the DQB2 and DQB3 genes.

UNIQUELY IDENTIFIED ALLELES

All the HLA-A alleles, i.e. **A*01:01 to A*80:02**, recognized by the HLA Nomenclature Committee in October 2010¹ will be amplified by the primers in the HLA-A low resolution primer set, **wells 1 to 21**. The HLA-A alleles will be grouped into their corresponding serological specificities².

All the HLA-B alleles, i.e. **B*07:02 to B*83:01**, recognized by the HLA Nomenclature Committee in October 2010¹ will be amplified by the primers in the HLA-B low resolution primer set, **wells 22 to 64**. The HLA-B alleles will be grouped into their corresponding serological specificities³.

All the HLA-DRB1, -DRB3, -DRB4⁴ and -DRB5 alleles, i.e. **DRB1*01:01:01 to 10:03**, **DRB3*01:01:01 to DRB3*03:03**, **DRB4*01:01:01:01 to DRB4*01:08**, **DRB5*01:01:01 to DRB5*02:05**, recognized by the HLA Nomenclature Committee in October 2010¹ will be amplified by the primers in the DR low resolution primer set, **wells 65 to 87**. The HLA-DRB alleles will be grouped into their corresponding serological specificities⁵.

All the DQB1 alleles, i.e. **DQB1*05:01:01 to 05:08**, **DQB1*06:01:01 to 06:40**, **DQB1*02:01:01 to 02:05**, **DQB1*03:01:01 to 03:31** and **DQB1*04:01 to 04:06**,

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recognized by the HLA Nomenclature Committee in October 2010¹ will be amplified by the primers in the DQ low resolution primer set. The DQB1 alleles will be grouped into their corresponding serological specificities, i.e.:

DQ5(1)	=	DQB1*05:01:01-05:08 ⁶
DQ6(1)	=	DQB1*06:01:01-06:40 ⁶
DQ2	=	DQB1*02:01:01-02:05
DQ3	=	DQB1*03:01:01-03:31 ⁶
DQ7(3)	=	DQB1*03:01:01-03:01:03, 03:04, 03:09, 03:13, 03:16, 03:19
DQ8(3)	=	DQB1*03:02:01, 03:05:01, 03:07, 03:08, 03:11, 03:18
DQ9(3)	=	DQB1*03:03:02, 03:12, 03:15, 03:17, 03:20
DQ4	=	DQB1*04:01-04:06 ⁶

¹HLA-A, HLA-B, HLA-DRB and HLA-DQB1 alleles listed on the IMGT/HLA web page 2010-October-15, release 3.2.0, www.ebi.ac.uk/imgt/hla.

²The A*36 alleles will give rise to identical amplification patterns as some A*01 alleles. These alleles can be separated by the A*01 and A*36 high resolution SSP primer sets.

The A*03:01:23, 03:08, 03:32, 03:36N, 03:57, 03:59, 03:72, 03:89, 03:107-03:108, 03:111 and the A*24:92 alleles will give rise to identical amplification patterns. These alleles can be separated by the respective high resolution SSP primer sets.

The A*23:14 and the A*24:05, 24:13:02 and 24:24 alleles will give rise to identical amplification patterns. These four alleles can be separated by the respective high resolution SSP primer sets.

³The B*08:26, 08:50, 08:62 and the B*42:07 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*14:08 and the B*39:25N, 39:30, 39:32-39:34, 39:43, 39:47 and 39:50 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*18:29 and the B*35:09:01-35:09:02, 35:18, 35:31-35:32, 35:37, 35:53N, 35:64, 35:68:01-35:68:02, 35:75, 35:88, 35:99, 35:118-35:119, 35:127 and 35:151 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*41:09 and the B*45:02-45:03 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*55:02:01-55:02:06, 55:07, 55:10, 55:12, 55:16, 55:19, 55:26, 55:30, 55:37, 55:39, 55:41-55:43, 55:47-55:48 and the B*56:10 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*55:04, 55:08, 55:13, 55:23, 55:27, 55:32, 55:46 and the B*56:15, 56:18-56:19N and 56:22 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

⁴The DRB4*02:01N and DRB4*03:01N null alleles will not be amplified by the DR low resolution primer set.

⁵The DRB1*08:09 and the DRB1*14:15 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The DRB1*08:20 and the DRB1*13:18, 13:47 and 13:55 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The DRB1*08:31, 08:41 and DRB1*11:67 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The DRB1*13:13 and DRB1*14:84 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

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⁶ The serological split of the DQB1*05:05, DQB1*06:06 to 06:08 alleles, the DQB1*06:10 to 06:40, the DQB1*03:02:02-03:02:04, DQB1*03:03:03, DQB1*03:05:02 to 03:26 and the DQB1*04:03 and 04:04 alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

SPECIFICITY TABLE

HLA-A low resolution primer set

Specificities and sizes of the PCR products of the 21 primer mixes used for HLA-A low resolution SSP typing

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	HLA-A serology ³	Amplified HLA-A alleles ^{4,10,11}
1^{5,6}	120, 140, 225 bp	800 bp	A1, A36	*01:01:01:01-01:04N, 01:06-01:81, 03:18, 36:01-36:05
2⁶	210, 255, 365, 415 bp	800 bp	A2	*02:01:01:01-02:01:15, 02:01:17-02:01:19, 02:01:21-02:22:02, 02:24-02:35:01, 02:35:03-02:47, 02:49-02:77, 02:78 ^w , 02:79:01-02:97:02, 02:99, 02:101-02:128, 02:130-02:282
3⁸	205, 235 bp	1070 bp	A1, A3, A11, A32, A34, A36	*01:12, 01:19, 01:21, 03:01:01:01-03:17, 03:19-03:74, 03:76-03:94, 03:96-03:112, 11:25, 11:60, 24:92, 32:04, 34:02-34:04, 34:07-34:09, 36:02
4	190 bp	800 bp	A1, A2, A3, A11, A26, A30, A36	*01:01:01:01-01:01:22, 01:01:24-01:04N, 01:06-01:07, 01:09-01:11N, 01:13, 01:16N-01:18N, 01:20-01:29, 01:31N-01:78, 01:80-01:81, 02:78, 02:169, 03:12, 03:18, 03:88, 11:01:01-11:27, 11:29-11:80, 26:19, 30:08, 36:04, 68:66
5	135, 175, 210 bp	800 bp	A2, A23, A24, A29, A80	*23:01:01-23:31, 24:05, 24:13:02, 24:24, 29:07, 31:29, 80:01-80:02, B*18:27
6	175, 200 bp	1070 bp	A2, A23, A24, A26, A33	*02:17:01 ^w -02:17:02 ^w , 23:14, 24:02:01:01-24:11N, 24:13:01-24:13:02, 24:17-24:50, 24:54-24:56, 24:58-24:63, 24:66-24:91, 24:93, 24:95-24:113, 24:115-24:137, 24:139-24:155N, 26:16, 33:19, 68:45
7	165, 200 bp	800 bp	A2, A3, A11, A25, A26, A32, A34, A66, A68, A69	*01:51, 02:55, 03:24, 03:50, 11:10, 25:01:01-25:13, 26:01:01-26:06, 26:08-26:15, 26:17-26:18, 26:20-26:43:02, 26:45-26:56, 32:15, 34:01:01-34:09, 66:01-66:15, 68:01:01-68:66, 69:01
8⁵	75 bp	800 bp	A25, A32	*25:01:01-25:13, 32:01:01-32:02, 32:04, 32:06-32:30

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9^{5,7}	85 bp	1070 bp	A2, A26, A33	*01:51, 02:146, 26:01:01-26:02, 26:04, 26:07:01-26:18, 26:20, 26:22-26:29, 26:31-26:43:02, 26:45-26:56, 33:13
10^{5,6,7}	80, 175, 500 bp	1070 bp	A1, A11, A24, A26, A31, A34, A66	*01:13, 01:28, 03:63, 03:88, 11:01:01-11:27, 11:29-11:80, 24:19, 24:44, 26:03:01-26:03:02, 26:06, 26:21, 31:03, 34:01:01-34:08, 66:01, 66:04-66:11, 66:13-66:15, 80:02
11	185 bp	800 bp	A11, A25, A26, A31, A34, A43, A66	*03:01:19, 11:11, 25:06, 26:09, 31:03-31:04, 34:01:01-34:09, 43:01, 66:02-66:03
12⁷	175, 225 bp	1070 bp	A1, A2, A3, A25, A26, A34, A43, A66	*01:13, 02:34-02:35:03, 02:56:01-02:56:02, 02:62, 02:103, 02:135, 03:01:01:01-03:01:22, 03:02-03:07, 03:09-03:11N, 03:13-03:31, 03:33-03:35, 03:37-03:40, 03:42-03:56, 03:58, 03:60-03:71, 03:73-03:87, 03:90-03:106, 03:109-03:110, 03:112, 25:01:01-25:05, 25:07-25:13, 26:01:01-26:01:18, 26:02 ^w , 26:03:01-26:03:02, 26:05-26:08, 26:10-26:33, 26:35-26:43:02, 26:45-26:56, 34:08, 43:01, 66:01, 66:04-66:15, 74:13
13⁵	100, 200, 240 bp	1070 bp	A29, A33	*02:237, 03:95, 26:19, 26:22, 29:01:01:01-29:27, 31:03-31:04, 33:13, 34:04, 66:09
14^{5,6}	90, 135, 205 bp	1070 bp	A1, A30	*01:13, 01:28, 03:43, 03:82, 30:01:01-30:04:02, 30:06-30:20, 30:22-30:46, 31:35
15	240, 370, 395 bp	1070 bp	A31, A32	*02:237, 03:95, 29:14, 31:01:02-31:46, 32:05
16	140, 180 bp	1070 bp	A29, A32	*03:43, 03:82, 29:13, 31:35, 32:01:01-32:03, 32:05-32:30, 36:02, 74:07
17	200 bp	1070 bp	A33, A68	*02:243, 33:01:01-33:01:05, 33:03:01-33:34, 68:29
18	160, 200 bp	800 bp	A74	*29:19, 74:01-74:14N
19	220, 245 bp	800 bp	A2, A210, A25, A30, A68	*02:34-02:35:03, 02:46, 02:48, 02:56:01-02:56:02, 02:62, 02:70, 02:78, 02:103, 02:129, 25:05, 26:54, 68:01:01-68:66
20	240, 375 bp	800 bp	A2, A24, A26, A68, A69	*02:55, 02:243, 24:82, 26:22, 33:22, 66:09, 68:29, 69:01
21^{5,9}	70, 160,	800 bp	A2, A26,	*02:55, 03:41, 03:63, 03:75, 03:88,

240, 495 bp	A68, A80	24:18, 26:03:01-26:03:02, 26:05-26:06, 26:21, 26:30, 33:24, 36:02, 68:05, 68:15, 68:20, 80:01
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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 HLA-A low resolution SSP typings. 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 1070 base pairs, for most wells, or a band of 800 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-A low resolution typing.

In addition, wells number 2, 4, 5, 7, 8, 11 and 18 to 21 contain the primer pair giving rise to the shorter, 800 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 HLA-A alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

⁴For several HLA-A alleles only partial 1st exon nucleotide sequences are available. We assume that unknown sequences are conserved within allelic groups.

Nucleotide sequence information is available for only exons 2 and 3 of many HLA Class I alleles and for only exon 2 of many HLA Class II alleles and not for other exons or for the introns of these alleles. We assume that unknown sequences in these exons and in the introns are conserved within loci and within allelic groups.

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

⁶The primer pairs in vials 1, 2, 10 and 14 will in many samples give rise to two or three HLA-specific PCR fragments.

⁷Primer mixes 9, 10 and 12 may yield less specific PCR product than the other primer mixes.

⁸Primer mix 3 may faintly amplify the A*30:04, 30:06, 30:17 and 30:29 alleles.

⁹Primer mix 21 may give rise to primer oligomer formation.

¹⁰The A*36 alleles will give rise to identical amplification patterns as a number of A*01 alleles. These alleles can be separated by the A*01 and A*36 high resolution SSP primer sets.

The A*03:01:23, 03:08, 03:32, 03:36N, 03:57, 03:59, 03:72, 03:89, 03:107-03:108, 03:111 and the A*24:92 alleles will give rise to identical amplification patterns. These alleles can be separated by the respective high resolution SSP primer sets.

The A*23:14 and the A*24:05, 24:13:02 and 24:24 alleles will give rise to identical amplification patterns. These four alleles can be separated by the respective high resolution SSP primer sets.

¹¹Primer mix 5 will amplify the B*18:27 allele.

‘w’, might be weakly amplified.

SPECIFICITY TABLE

HLA-B low resolution primer set

Specificities and sizes of the PCR products of the 43 primer mixes used for HLA-B low resolution SSP typing

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	HLA-B serol. ³	Amplified HLA-B alleles ^{4,5}
22¹⁰	285 bp	800 bp	7, 15, 37, 40, 41, 42, 48	*07:02:01-07:06, 07:08-07:18:02, 07:20-07:32, 07:34-07:39, 07:41-07:52, 07:54-07:59, 07:61-07:76, 07:79-07:83, 07:85-07:99, 07:101-07:117, 08:01:01-08:05, 08:07-08:08N, 08:10-08:11, 08:13-08:15, 08:17-08:66, 35:66, 35:87, 37:07, 40:15-40:16, 40:30-40:32, 40:34, 40:45, 40:59, 40:80, 40:98, 40:137, 41:02:01-41:02:03, 41:04, 41:10-41:11, 41:13, 42:01:01-42:02, 42:05:01-42:07, 42:09-42:13, 48:01:01-48:01:03, 48:05-48:12, 48:14-48:20, 48:22, 53:15, 81:01-81:05
23	215 bp	1070 bp	8, 15, 44	*08:01:01-08:05, 08:07-08:25, 08:27-08:49, 08:51-08:61, 08:63-08:64, 08:66, 15:142, 15:180, 44:49, 51:68
24	140, 235 bp	1070 bp	7, 8, 13, 15, 35, 40, 4005, 44, 46, 53, 57, 58	*07:20, 07:24, 07:60, 07:100, 08:21, 08:25, 13:01:01-13:04, 13:06-13:08Q, 13:10-13:23, 13:25-13:38, 13:40, 15:07:01-15:07:02, 15:36 ^w , 15:45, 15:55, 15:68, 15:89 ^w , 15:126, 15:205, 15:207, 35:05:01-35:05:02, 35:16-35:17, 35:22, 35:30, 35:51, 35:58, 35:72, 35:89, 35:97, 35:113-35:114, 35:125, 40:05, 40:71, 44:08 ^w , 44:54, 44:57 ^w , 44:60, 44:106, 44:110, 46:12, 46:20, 51:64, 53:14, 58:18, C*03:05, C*03:25, C*03:27
25⁷	130, 265 bp	800 bp	13, 14, 15, 35, 40, 41, 44, 45, 47, 49, 50	*13:01:01-13:04, 13:06-13:13, 13:15-13:23, 13:25-13:40, 14:01:01-14:04, 14:07N, 14:09, 14:11-14:12, 14:14-14:19, 15:46, 15:53, 15:106, 18:44, 35:46-35:47, 35:63, 40:01:01-40:01:17, 40:07, 40:10:01-40:10:02, 40:14:01-40:16, 40:22N-40:23, 40:25, 40:30-40:34, 40:36, 40:38, 40:42-40:43, 40:45, 40:47-40:49, 40:51-40:55, 40:58-40:63, 40:65-40:67, 40:69, 40:72:01-40:73, 40:76-40:77, 40:79-40:81, 40:84, 40:87-40:88, 40:92,

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26⁸	185, 235 bp	800 bp	14, 16, 27, 37, 38, 39, 47, 64, 67	*14:01:01-14:01:02, 14:07N-14:08, 14:10, 14:12, 14:14, 14:19, 27:01-27:06, 27:08-27:10, 27:12-27:13, 27:16-27:18, 27:20, 27:23, 27:26-27:27, 27:29, 27:31, 27:35-27:37, 27:39-27:42, 27:44-27:46, 27:48-27:61, 27:64N-27:69, 27:72-27:73, 37:02, 38:01:01-38:02:02, 38:03, 38:07-38:24, 38:26, 39:01:01:01-39:01:01:02L, 39:01:03-39:01:08, 39:01:10-39:02:01, 39:03, 39:05:01-39:09, 39:11, 39:14-39:15, 39:18, 39:19:02, 39:22, 39:24-39:44, 39:46-39:48, 39:50-39:62, 47:04-47:05, 48:21, 67:01:01, 67:03
27	190 bp	800 bp	14, 35, 38, 39, 65	*07:28, 14:02:01-14:02:02, 14:02:04-14:02:05, 14:03-14:06:02, 14:09, 14:11, 14:13, 14:15-14:18, 15:77, 15:189, 35:26, 38:05, 39:04, 44:16, 44:37, 44:64:01-44:64:02, 44:91, 57:04, A*23:31, A*24:106, C*16:10
28	290 bp	1070 bp	15, 62, 63, 75, 76, 77, 46	*15:01:01:01-15:01:03, 15:01:06-15:02:05, 15:03:03-15:08, 15:10:02-15:11:03, 15:11:05-15:15, 15:17:01:01-15:17:02, 15:19-15:21, 15:24-15:28, 15:30-15:36, 15:38:01-15:40, 15:42-15:46, 15:48, 15:50, 15:55-15:58, 15:60, 15:63, 15:65-15:66, 15:70-15:71, 15:73, 15:75-15:79N, 15:81-15:89, 15:92, 15:94N, 15:96-15:97, 15:101-15:102, 15:104-15:107, 15:109-15:113, 15:116-15:118, 15:120-15:122, 15:125-15:126, 15:128-15:129, 15:135-15:150, 15:152, 15:154-15:155, 15:157, 15:159-15:160, 15:162-15:172, 15:174-15:175, 15:177-15:179, 15:181N-15:185, 15:187-15:196, 15:199, 15:201-15:209N, 46:01:01-46:26

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29	165, 220, 330 bp	1070 bp	8, 15, 35, 37, 40, 41, 42, 44, 45, 51, 56, 57, 70, 71, 72	*08:01:01-08:05, 08:08N-08:12:03, 08:15- 08:19N, 08:21-08:24, 08:26-08:27, 08:29- 08:36, 08:38-08:39, 08:41-08:48, 08:50- 08:54, 08:56-08:66, 15:03:01-15:03:03, 15:09-15:10:02, 15:18:01-15:18:04, 15:23, 15:29, 15:37, 15:46-15:47, 15:49, 15:51-15:54, 15:61-15:62, 15:64, 15:69, 15:72, 15:74, 15:80, 15:83, 15:90-15:91, 15:93, 15:98-15:99, 15:103, 15:106, 15:108, 15:114-15:115, 15:119, 15:123- 15:124, 15:127, 15:131-15:134, 15:143, 15:151, 15:153, 15:156, 15:158, 15:161, 15:173, 15:176, 15:180, 15:186, 15:197- 15:198, 15:200, 35:87, 37:12, 40:12, 40:136, 41:01-41:03:02, 41:05-41:09, 41:11-41:16, 42:01:01-42:02, 42:04- 42:08, 42:10-42:14, 44:14-44:15, 44:18, 44:20, 44:62, 44:100, 45:01-45:13, 51:08, 51:20, 51:36, 51:44N, 51:97, 52:19, 55:20, 56:13, 57:09, 82:01-82:03, C*07:46
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31	180 bp	800 bp	13, 15, 40, 55, 62, 70, 71, 72, 75	*07:78, 13:01:01-13:02:09, 13:07N-13:09, 13:11, 13:14-13:20, 13:22:01-13:23, 13:25, 13:27-13:34, 13:36-13:40, 40:48, 45:10, 49:07, 55:09, 55:22, 55:24
32⁶	105, 195 bp	1070 bp	7, 8, 15, 27, 38, 39, 40, 44, 45, 48, 55, 72	*07:27, 07:50, 08:04, 08:17, 08:54, 15:03:01-15:03:03, 15:47, 15:49, 15:54, 15:61-15:62, 15:64, 15:68-15:69, 15:91, 15:98, 15:103, 15:123, 15:127, 15:131- 15:132, 15:151, 15:156, 15:158, 15:173, 18:37, 27:18, 27:29, 38:03, 39:02:01- 39:02:02, 39:08, 39:13:01-39:13:02, 39:23, 39:39, 39:49, 40:12, 40:46, 40:93, 42:11, 44:10, 44:15, 44:18, 44:40, 44:44,

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34⁶	105, 395, 435 bp	1070 bp	7, 15, 41, 42, 59, 62, 63, 77	*07:04, 07:25, 15:09-15:10:02, 15:13, 15:16-15:18:04, 15:21, 15:23-15:24, 15:37, 15:44, 15:51-15:52, 15:66-15:67, 15:72, 15:80, 15:87, 15:90, 15:93, 15:95, 15:99, 15:108, 15:114-15:115, 15:119, 15:124, 15:133-15:134, 15:153, 15:157, 15:161-15:162, 15:168, 15:176-15:177, 15:186, 15:189, 15:196-15:198, 15:200, 15:208, 40:136, 41:08, 42:05:01-42:05:02
35⁶	115, 150 bp	1070 bp	18	*18:01:01-18:15, 18:17N-18:28, 18:30- 18:52
36⁶	80 bp	1070 bp	27, 40, 44	*07:73, 27:01-27:21, 27:23-27:51, 27:53- 27:66N, 27:68-27:73, 38:22, 40:46, 40:93, 44:40, 44:44
37	150 bp	800 bp	13, 15, 18, 27, 35, 37, 39, 40, 44, 48, 51, 53, 55, 56, 57, 58, 62, 75, 77	*08:49, 13:01:01-13:01:05, 13:06-13:07N, 13:12-13:13, 13:17, 13:20, 13:22:01- 13:23, 13:25-13:26, 13:28-13:29, 13:36, 13:39, 14:10, 15:02:01-15:02:05, 15:13, 15:20-15:21, 15:25:01-15:25:03, 15:36, 15:44, 15:62, 15:77, 15:80, 15:85, 15:88- 15:89, 15:106, 15:112, 15:121, 15:139, 15:144, 15:154, 15:165, 15:170, 15:194, 15:204, 18:22, 27:19, 27:30, 35:01:01-01- 35:04:03, 35:06-35:08:04, 35:10-35:17, 35:19-35:21, 35:23-35:30, 35:33-35:36, 35:38-35:42:02, 35:45-35:50, 35:52, 35:54-35:57, 35:59, 35:61-35:63, 35:65Q, 35:69-35:71, 35:74, 35:76-35:78, 35:80- 35:85, 35:90-35:96, 35:98, 35:100- 35:101:02, 35:103-35:113, 35:115- 35:116, 35:120-35:126, 35:128-35:134N, 35:136-35:150, 37:01:01-37:01:07, 37:03N-37:06, 37:08, 37:10-37:11, 37:13- 37:25, 38:20, 39:42, 40:28, 44:02:01:01- 44:14, 44:16-44:17, 44:19N, 44:21-44:30, 44:32-44:40, 44:42-44:46, 44:48-44:52N, 44:55-44:64:02, 44:66-44:98, 44:101- 44:105, 44:107-44:115, 48:02:01- 48:02:02, 51:04, 51:42, 51:46, 51:56, 53:01:01-53:13, 53:15-53:24,

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38	135 bp	1070 bp	7, 8, 18, 35, 37, 39, 56, 78	*07:65, 08:32, 15:202, 18:01:01-18:08, 18:10-18:15, 18:17N-18:36, 18:38-18:47, 18:50-18:52, 35:01:01:01-35:03:02, 35:03:04-35:18, 35:20:01-35:24:02, 35:28-35:45, 35:48, 35:50-35:55, 35:57-35:62, 35:64-35:72, 35:74-35:151, 37:11, 39:19:01-39:19:02, 56:06, 78:01-78:05, 78:07
39^{6,10}	60, 245, 400 bp	1070 bp	15, 62, 63, 70, 71, 72, 75, 76, 77, 40, 44	*15:01:01:01-15:01:04, 15:01:06-15:21, 15:23-15:40, 15:42-15:58, 15:60-15:67, 15:69-15:99, 15:102-15:129, 15:131-15:209N, 40:12, 44:10, 82:01-82:03
40¹⁰	210 bp	800 bp	7, 8, 15, 18, 37, 38	*07:27, 08:49, 37:01:01-37:25, 38:17
41	170 bp	800 bp	15, 35, 38, 39, 67	*08:55, 15:69, 15:186, 35:35, 38:01:01-38:09, 38:11-38:21, 38:23-38:26, 39:01:01:01-39:01:01:02L, 39:01:03-39:20, 39:22-39:24, 39:26-39:29, 39:31, 39:35, 39:37-39:42, 39:44-39:46, 39:48-39:49, 39:51-39:62, 51:101, 58:20, 67:01:01-67:03
42⁶	110 bp	1070 bp	38	*38:01:01-38:02:02, 38:03, 38:05, 38:08-38:24, 38:26
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44	160, 425 bp	1070 bp	7, 8, 14, 39, 40, 41, 42, 45, 48, 50, 60, 64, 65, 67, 73	*07:02:01-07:26, 07:28-07:35, 07:37, 07:39-07:64, 07:66-07:80, 07:82-07:117, 08:01:01-08:01:13, 08:04-08:05, 08:07-08:35, 08:37-08:51, 08:53-08:66, 14:01:01-14:02:04, 14:02:06-14:19, 27:14, 39:01:01:01-39:01:01:02L, 39:01:03-39:20, 39:22-39:62,

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46⁶	105 bp	1070 bp	7, 8, 35, 41, 42, 55	*07:04, 07:25, 08:01:01-08:05, 08:07-08:12:03, 08:14-08:19N, 08:21-08:24, 08:26-08:39, 08:41-08:54, 08:56-08:66, 35:87, 40:136, 41:01-41:08, 41:10-41:16, 42:01:01-42:02, 42:04-42:07, 42:09-42:14, 55:20

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52	145, 430 bp	1070 bp	40, 44, 49	*40:13, 40:19, 40:109, 40:117, 44:18, 44:25, 44:50, 44:95, 49:01:01-49:01:02, 49:04-49:15, 54:12, 56:21, 59:01-59:05
53⁶	120, 210 bp	800 bp	13, 15, 45, 49, 50, 51, 52, 55, 56, 58, 62, 63, 78	*07:78, 07:84, 13:16, 13:31 ^w , 15:04 ^w , 15:16, 15:42, 15:67, 15:95, 15:137 ^w , 40:95, 40:148, 49:01:01, 49:02-49:10, 49:12-49:15, 50:01:01-50:02, 50:04- 50:11, 51:01:01-51:03, 51:05, 51:07:01- 51:09:02, 51:11N-51:14, 51:16-51:24:04, 51:26-51:41N, 51:43-51:44N, 51:48- 51:55, 51:57-51:58, 51:60, 51:61 ^w , 51:63, 51:65-51:80, 51:82-51:106, 52:01:01- 52:22, 54:20, 55:01:01-55:01:06, 55:03, 55:05, 55:09, 55:11, 55:15, 55:17, 55:21 ^w , 55:24-55:25, 55:28-55:29, 55:31, 55:33, 55:36, 55:38, 55:40, 55:44-55:45, 56:05:01-56:06, 56:21, 56:25, 58:08, 78:01-78:07
54	430 bp	1070 bp	27, 40, 44, 45, 51, 52, 53, 57, 58, 59	*27:02, 27:30, 27:53, 27:57, 27:62, 27:65N, 40:13, 40:19, 40:109, 40:117, 44:06, 44:25, 44:50, 44:95, 51:01:01- 51:24:04, 51:26-51:46, 51:48-51:53, 51:55-51:77, 51:79-51:106, 52:01:01- 52:19, 52:21-52:22, 53:01:01-53:02, 53:04-53:08:02, 53:10, 53:14-53:24, 57:01:01-57:11, 57:13-57:37, 58:01:01- 58:02, 58:04-58:16, 58:18-58:31N
55	145 bp	1070 bp	15, 35, 40, 41, 44, 45, 47, 50, 72	*15:46, 15:53, 15:106, 15:143, 18:48, 35:19, 35:47, 35:63, 40:01:01-40:11:02, 40:14:01-40:16, 40:18, 40:20, 40:22N- 40:40, 40:42-40:45, 40:48-40:75, 40:77- 40:92, 40:94-40:95, 40:97-40:108, 40:111-40:116, 40:118N-40:136, 40:138- 40:156, 40:158, 41:01-41:04, 41:05 [?] , 41:06-41:16, 44:09, 44:46, 44:75, 44:90, 45:01-45:13, 47:02, 47:03 ^w , 50:01:01- 50:02, 50:04-50:05, 50:07-50:12
56	300 bp	1070 bp	7, 8, 13, 15, 18, 27, 35, 37, 38, 39, 40, 41, 44, 45, 46, 47, 48, 49, 50,	*07:54, 08:17, 08:38, 08:54, 13:01:01- 13:04, 13:06, 13:08Q-13:23, 13:25-13:35, 13:37-13:40, 15:01:01:01-15:01:04, 15:01:06-15:01:18, 15:01:20, 15:03:01- 15:07:02, 15:12, 15:14, 15:19-15:20, 15:24-15:27:03, 15:30, 15:32-15:36, 15:38:01-15:40, 15:42-15:43, 15:45- 15:50, 15:53-15:54, 15:56-15:58, 15:60- 15:63, 15:65-15:66, 15:68-15:71,

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57¹²	160, 330 bp	1070 bp	15, 37, 44, 54	*44:02:01:01-44:02:14, 44:06, 44:08- 44:09, 44:11-44:12, 44:16, 44:19N-44:24, 44:27, 44:33-44:34, 44:41, 44:44, 44:48- 44:49, 44:52N-44:53, 44:55, 44:59, 44:63, 44:66-44:68, 44:71-44:74, 44:80, 44:83- 44:84, 44:86-44:87, 44:89-44:91, 44:93, 44:95, 44:97, 44:99-44:102, 44:104, 44:106, 44:112-44:113, 54:01-54:23, 83:01
58	180, 210 bp	1070 bp	7, 13, 15, 18, 35, 39, 40, 45, 54, 55, 56, 59, 78	*07:65, 13:06, 15:42, 15:86, 18:04, 35:42:02, 35:43:02, 35:60, 39:17, 40:01:11, 40:58, 45:08, 46:18, 54:01- 54:02, 54:05N, 54:07-54:08N, 54:10, 54:12-54:13, 54:16-54:23, 55:01:01- 55:03, 55:05, 55:07, 55:10-55:12, 55:15- 55:16, 55:18-55:19, 55:21, 55:25-55:26, 55:29-55:31, 55:33-55:45, 55:47-55:48, 56:05:01, 56:06, 56:10, 56:23, 59:01, 59:05, 78:01, 78:02:02-78:03, 78:07, C*15:02:04
59	180 bp	1070 bp	13, 15, 40, 44, 45, 46,	*13:03, 15:73, 40:71, 44:10, 44:15, 44:18, 45:01, 45:04-45:07, 45:11-45:13, 46:11, 49:01:01-49:03, 49:06, 49:08-49:15,

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			49, 50, 51, 54, 56	50:01:01-50:02, 50:04-50:08, 50:10- 50:12, 51:15, 51:62, 51:106, 54:03, 56:01:01-56:02, 56:04, 56:07-56:08, 56:13-56:14, 56:16-56:17, 56:20, 56:24- 56:30, 59:04, 82:01-82:03, C*03:12, C*03:19, C*03:102
60^{6,10}	90, 240 bp	800 bp	55, 57	*55:14, 57:01:01-57:37
61^{6,8}	95 bp	1070 bp	7, 8, 18, 35, 37, 38, 39, 44, 51, 52, 53, 78	*07:65^w, 08:32, 18:01:01-18:11, 18:13- 18:15, 18:17N-18:36, 18:38-18:47, 18:49- 18:52, 35:01:01:01-35:09:02, 35:11:01- 35:12:02, 35:14:01-35:15, 35:17-35:18, 35:20:01-35:24:02, 35:27, 35:29-35:45, 35:48, 35:50-35:62, 35:64-35:68:02, 35:70-35:72, 35:74-35:75, 35:76^w, 35:77- 35:79, 35:81-35:151, 37:08, 38:06-38:07, 39:19:01-39:19:02, 44:06, 51:01:01- 51:24:04, 51:26-51:46, 51:48-51:103, 51:105-51:106, 53:01:01-53:16, 53:18- 53:24, 56:06^w, 78:01-78:04, 78:07
62⁶	115, 150 bp	1070 bp	15, 18, 27, 35, 39, 46, 54, 55, 56, 62, 73, 75, 76	*07:100, 13:31, 15:01:01:01-15:01:04, 15:01:06-15:01:16, 15:01:18-15:01:20, 15:04, 15:07:01-15:08, 15:11:01-15:12, 15:14-15:15, 15:19, 15:24, 15:26N-15:28, 15:30, 15:32, 15:34-15:35, 15:38:01- 15:38:02, 15:43, 15:45-15:46, 15:50, 15:53-15:54, 15:56-15:58, 15:60, 15:63, 15:66, 15:68, 15:70-15:71, 15:73, 15:75- 15:77, 15:79N, 15:81-15:82, 15:85, 15:87, 15:92, 15:94N, 15:96-15:97, 15:101- 15:102, 15:104-15:105, 15:109-15:111N, 15:113, 15:117-15:118, 15:120, 15:122, 15:125-15:126, 15:128-15:129, 15:135, 15:137, 15:140, 15:142-15:149N, 15:152, 15:154, 15:157, 15:159-15:160, 15:163- 15:167, 15:169, 15:171-15:172, 15:174- 15:175, 15:178, 15:180-15:184, 15:187, 15:189-15:193, 15:201-15:203, 15:205- 15:207, 15:209N, 18:19, 27:25, 35:14:01- 35:14:02, 35:43:01-35:44, 35:62, 35:67, 35:79, 35:86, 35:102, 35:117, 35:135, 39:18, 39:36, 46:01:01-46:02, 46:04- 46:05, 46:07N, 46:09-46:10, 46:12, 46:14-46:17, 46:20, 46:22-46:24, 51:61, 52:21, 54:06, 55:21, 56:03, 73:01-73:02, A*68:56, C*06:20, C*12:50
63	360 bp	1070 bp	Bw4 ¹⁶	
64	350 bp	1070 bp	Bw6	

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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 HLA-B low resolution SSP typings.

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 1070 base pairs, for most wells, or a band of 800 base pairs, for some wells.

Well number 22 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-B low resolution typing.

In addition, wells number 25, 26, 27, 31, 37, 40, 41, 53 and 60 contain the primer pair giving rise to the shorter, 800 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 HLA-B alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

⁴Nucleotide sequence information is available for only exons 2 and 3 of many HLA Class I alleles and for only exon 2 of many HLA Class II alleles and not for other exons or for the introns of these alleles. We assume that unknown sequences in these exons and in the introns are conserved within loci and within allelic groups.

The B*08:26, 08:50, 08:62 and the B*42:07 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*14:08 and the B*39:25N, 39:30, 39:32-39:34, 39:43, 39:47 and 39:50 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*18:29 and the B*35:09:01-35:09:02, 35:18, 35:31-35:32, 35:37, 35:53N, 35:64, 35:68:01-35:68:02, 35:75, 35:88, 35:99, 35:118-35:119, 35:127 and 35:151 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*41:09 and the B*45:02-45:03 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*55:02:01-55:02:06, 55:07, 55:10, 55:12, 55:16, 55:19, 55:26, 55:30, 55:37, 55:39, 55:41-55:43, 55:47-55:48 and the B*56:10 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*55:04, 55:08, 55:13, 55:23, 55:27, 55:32, 55:46 and the B*56:15, 56:18-56:19N and 56:22 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

⁵The HLA-C*03:05,03:25 and 03:27 alleles will be amplified by primer mix 24, the C*01:30 allele will be amplified by primer mix 25, the A*23:31, A*24:106 and C*16:10 alleles will be amplified by primer mix 27, the C*07:46 allele will be amplified by primer mix 29, the C*03:102 allele will be amplified by primer mix 37, the C*15:25 allele will be amplified by primer mix 48, the C*15:39 allele will be amplified by primer mix 49, the C*15:02:04 allele will be amplified by primer mix 58, the C*03:12, C*03:19 and C*03:102 alleles will be amplified by primer mix 59 and the A*68:56, C*06:20 and C*12:50 alleles will be amplified by primer mix 62.

⁶Specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.

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⁷Primer mix 25 may yield less specific PCR product than the other HLA-B low resolution primer mixes in B*40, B*41, B*45, B*49 and B*50 alleles.

⁸Primer mixes 26, 30 and 61 may yield less specific PCR product than the other HLA-B low resolution primer mixes.

⁹Primer mix 30 has a higher tendency than other primer mixes to give rise to nonspecific amplifications.

¹⁰Primer mixes 22, 39, 40 and 60 may give rise to a primer oligomer artifact.

¹¹The B*57 and B*58 alleles might be faintly amplified by primer mix 30.

¹²Primer mix 57 may yield less specific PCR product than the other HLA-B low resolution primer mixes in B*54 alleles.

¹³The C*17:01 to C*17:04 alleles might be faintly amplified by primer mix 45.

¹⁴Primer mix 50 might generate a false band of about 500 base pairs. This band should be disregarded when interpreting HLA-B low resolution typings.

¹⁵In primer mix 49, the positive control band may be weaker than for other HLA-B low primer mixes. However, the amplification of the HLA-specific bands is of comparable strength to other HLA B low primer mixes.

¹⁶The Bw4-associated HLA-A specificities A23, A24, A2403, A25 and A32 are not amplified by the primer pair in primer mix 63.

‘w’, might be weakly amplified.

‘?’, nucleotide sequence information not available for the primer matching sequence.

SPECIFICITY TABLE

Specificities and sizes of the PCR products of the 23 primer mixes used for DR low resolution SSP typing

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	DR serology ³	Amplified HLA-DRB alleles ⁴
65^{6,7}	200, 255 bp	515 bp	1	*01:01:01-01:02:05, 01:04-01:34
66	200 bp	430 bp	103	*01:03
67	215 bp	430 bp	15	*15:01:01:01-15:49, 15:50N ^w , 15:51
68	210 bp	430 bp	16	*16:01:01-16:05:02, 16:07-16:17
69^{5,6,10}	120, 220 bp	430 bp	3, 17, 18, 11	*03:01:01:01-03:58, 11:07, 11:53, 15:25
70^{5,6,10}	80, 210 bp	430 bp	3, 17, 11, 13, 14	*03:01:01:01-03:01:09, 03:04-03:06, 03:08-03:16, 03:18-03:20, 03:22-03:23, 03:25-03:26, 03:28, 03:30-03:31, 03:33-03:34, 03:36-03:37, 03:43-03:48, 03:50-03:52, 03:54-03:58, 08:40, 11:02:01-11:03, 11:11:01-11:11:02, 11:14:01-11:14:02, 11:16, 11:20-11:21, 11:36, 11:40-11:41, 11:48, 11:59, 11:63, 11:65:01-11:65:02, 11:68, 11:70, 11:73, 11:76, 11:79-11:80, 11:83, 11:85-11:87, 11:93, 13:01:01-13:04, 13:08, 13:10, 13:15-13:17, 13:19-13:20, 13:22-13:24, 13:27-13:29, 13:31-13:41, 13:43, 13:45, 13:48, 13:51-13:54, 13:57, 13:59, 13:61, 13:63-13:66:02, 13:68-13:76, 13:78-13:81, 13:83-13:85, 13:87-13:99, 13:101-13:102, 14:16, 14:19, 14:21, 14:82, 14:95
71^{5,6}	85, 210 bp	430 bp	3, 18, 11, 13, 14	*03:02:01-03:03, 03:27, 03:29, 03:38, 03:53, 11:13:01 ^w -11:13:02 ^w , 11:26, 11:34, 13:15, 13:19, 13:26, 13:44, 13:53, 13:57, 13:85-13:86, 14:02-14:03:02, 14:06:01-14:06:02, 14:09, 14:12:01-14:13, 14:17-14:21, 14:24, 14:27, 14:29-14:30, 14:32:01 ^w -14:32:02 ^w , 14:33, 14:40-14:41, 14:47-14:49, 14:51, 14:63, 14:65 ^w , 14:67, 14:77-14:78, 14:80-14:81, 14:83, 14:85, 14:89, 14:94, 14:98
72^{5,6}	100, 175 bp	430 bp	4	*04:01:01-04:92

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73	210, 230 bp	430 bp	7, 13, 14	*07:01:01:01-07:01:03, 07:03-07:19, 12:22, 13:17, 14:50
74	170, 215, 250 bp	515 bp	8, 12, 14	*08:01:01-08:19, 08:21-08:41, 11:67, 12:04, 12:16, 12:22, 14:11, 14:15, 14:68, 14:93
75^{5,8}	85, 135, 180 bp	430 bp	3, 9, 11	*03:08, 09:01:02-09:09, 11:07, 11:53
76	205 bp	430 bp	10	*10:01:01-10:03
77⁵	100, 170 bp	430 bp	11, 3, 8	*03:08, 08:31, 08:41, 11:01:01-11:70, 11:72-11:98
78⁵	85, 105 bp	430 bp	12, 8	*08:32, 12:01:01-12:26
79	215 bp	430 bp	13, 8, 11, 14	*08:20-08:21, 11:01:01-11:04:06, 11:06:01-11:06:02, 11:08:01-11:12:02, 11:14:01-11:16, 11:18-11:21, 11:23-11:25, 11:27:01-11:33, 11:35-11:51, 11:54:01-11:54:02, 11:56-11:66, 11:68, 11:70, 11:72-11:81, 11:83-11:88, 11:90-11:97, 13:01:01-13:08, 13:10-13:16, 13:18-13:43, 13:45-13:85, 13:87-13:103, 14:03:01-14:03:02, 14:12:01-14:12:02, 14:16, 14:19, 14:21-14:22, 14:25, 14:27, 14:40, 14:53, 14:63, 14:67, 14:69, 14:74, 14:77-14:78, 14:84-14:85, 14:98
80⁶	195, 215 bp	430 bp	13, 8, 11, 12, 14	*08:01:01-08:02:03, 08:04:01-08:09, 08:11, 08:16-08:17, 08:20-08:22, 08:24, 08:26, 08:28, 08:31, 08:39, 08:41, 11:01:01-11:06:02, 11:09-11:12:02, 11:14:01-11:16, 11:20-11:21, 11:23-11:25, 11:27:01-11:30, 11:32-11:33, 11:35-11:41, 11:43-11:44, 11:46-11:51, 11:54:01-11:56, 11:58:01-11:63, 11:65:01-11:70, 11:72, 11:74-11:78, 11:80-11:88, 11:90-11:97, 12:02:01-12:02:05, 12:13, 12:15-12:16, 12:18-12:21, 12:23, 12:26, 13:01:01-13:02:01, 13:02:03-13:02:04, 13:04-13:05:02, 13:07:01-13:09, 13:11:01-13:11:02, 13:14:01-13:24, 13:26-13:29, 13:31-13:32, 13:34-13:36, 13:38-13:43, 13:45-13:55, 13:57, 13:59, 13:61-13:65, 13:67-13:76, 13:78-13:80, 13:83-13:84, 13:87, 13:91-13:93, 13:96-13:100, 13:102-13:103,

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				14:15-14:16, 14:22, 14:24-14:25, 14:27, 14:37, 14:53, 14:73
81¹⁰	175 bp	430 bp	3, 13, 14, 8	*03:01:01:01-03:07, 03:09, 03:11:01-03:41, 03:43-03:45, 03:47- 03:58, 08:20, 13:01:01-13:16, 13:18-13:42, 13:44, 13:46-13:66:02, 13:68-13:102, 14:02-14:03:02, 14:05:01-14:06:02, 14:09, 14:12:01- 14:14, 14:17-14:21, 14:23:01, 14:23:03-14:24, 14:27, 14:29-14:30, 14:33, 14:36-14:37, 14:40-14:45, 14:47-14:48, 14:51, 14:56, 14:59, 14:63-14:65, 14:67, 14:77-14:78, 14:80-14:81, 14:83-14:85, 14:89, 14:91, 14:94-14:96, 14:98, 14:100
82⁵⁻⁷	100, 140, 155 bp	430 bp	14, 4, 8,13	*04:62, 04:69, 04:73, 08:08, 11:69, 11:82, 13:45, 14:01:01-14:01:02, 14:04, 14:07:01-14:07:02, 14:10, 14:16, 14:22, 14:25-14:26, 14:28, 14:31-14:32:02, 14:35, 14:37-14:39, 14:49-14:50, 14:53-14:55, 14:57- 14:58, 14:60-14:62, 14:68-14:71, 14:73-14:76, 14:79, 14:82, 14:86- 14:88, 14:90, 14:93, 14:99, DRB4*01:03:01:02N
83^{5,6,9}	110, 135, 170 bp	430 bp	14, 3, 9, 11, 12, 13, 15	*03:10, 09:01:02-09:01:05, 09:01:07-09:02:02, 09:04-09:09, 11:13:01-11:13:02, 11:17, 11:52, 13:43, 14:01:01-14:02, 14:04-14:11, 14:13-14:14, 14:16-14:18, 14:19 ^w , 14:20, 14:21 ^w , 14:22-14:23:03, 14:26, 14:28-14:36, 14:38-14:39, 14:41, 14:43-14:52, 14:54-14:57, 14:59-14:62, 14:64-14:65, 14:68, 14:70-14:76, 14:79-14:83, 14:86- 14:88, 14:90-14:97, 14:99-14:100, 15:27, 15:34
84⁵⁻⁷	110, 175, 225 bp	430 bp	14, 3, 8, 11, 13, 15, 16	*03:10, 08:09, 08:20-08:21, 08:32, 08:35, 11:13:01-11:13:02, 11:17, 11:23, 11:25, 11:31, 11:45, 11:52, 11:55, 11:64, 11:89, 11:96, 13:13, 13:18, 13:43, 13:45, 13:47, 13:55, 14:01:01-14:01:03, 14:03:01- 14:05:03, 14:07:01-14:08, 14:10- 14:12:02, 14:14-14:16, 14:18, 14:22-14:23:03, 14:25-14:28,

				14:31-14:32:02, 14:34-14:36, 14:38-14:40, 14:42-14:45, 14:49-14:50, 14:53-14:65, 14:67-14:79, 14:81-14:82, 14:84-14:93, 14:95-14:97, 14:99-14:100, 15:21 ^w , 16:04 ^w
85¹⁰	160, 240 bp	430 bp	52	DRB3*01:01:02:01-01:14, DRB3*02:01-02:25, DRB3*03:01:01-03:03
86¹¹	215 bp	430 bp	53	DRB4*01:01:01-01:08
87	175 bp	430 bp	51	DRB5*01:01:01-01:14, DRB5*02:02-02:05

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 typings.

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, e.g. the primers in wells 67, 72, 82, 83 and 84.

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 65 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 74 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. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

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.

Nucleotide sequence information is available for only exons 2 and 3 of many HLA Class I alleles and for only exon 2 of many HLA Class II alleles and not for other exons or for the introns of these alleles. We assume that unknown sequences in these exons and in the introns are conserved within loci and within allelic groups.

The DRB1*08:09 and the DRB1*14:15 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets. The DRB1*08:20 and the DRB1*13:18, 13:47 and 13:55 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

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The DRB1*08:31, 08:41 and DRB1*11:67 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The DRB1*13:13 and DRB1*14:84 alleles yield identical amplification patterns with the DR low resolution primer set. 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 65 and 69 to 72.

⁷Primer mixes 65, 82 and 84 may give rise to primer oligomer formation.

⁸Primer mix 75 may have tendencies of unspecific amplification.

⁹Primer mix 83 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.

¹⁰Due to sharing of sequence motifs in codon 38, DRB3*01:14 will also be amplified in primer mixes 69, 70 and 81 in addition to primer mix 85.

¹¹The DRB4*01:03:01:02N allele is amplified by the primer pair in well No. 86, whereas the DRB4*02:01N and DRB4*03:01N null alleles are not amplified by this primer pair.

‘w’, might be weakly amplified.

SPECIFICITY TABLE

DQ low resolution SSP typing

Specificities and sizes of the PCR products of the 8 primer mixes used for DQ low resolution SSP typing

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	DQ serology ³	Amplified DQB1 alleles ⁴
88	225 bp	515 bp	5	*05:01:01-05:08
89⁵	220, 270 bp	430 bp	1, 5, 6	*06:01:01-06:40
90	210 bp	430 bp	2	*02:01:01-02:05
91⁶	220 bp	515 bp	3, 7	*03:01:01-03:01:05, 03:04, 03:09-03:10, 03:13-03:14, 03:16, 03:19, 03:21-03:22, 03:24, 03:27-03:29
92⁶	130 bp	515 bp	6, 8	*03:02:01-03:02:05, 03:05:01-03:05:04, 03:07-03:08, 03:11, 03:18, 06:29
93^{5,6,7}	135 bp	515 bp	2, 3, 9	*02:03, 03:03:02- 03:03:03, 03:06, 03:12, 03:15, 03:20, 03:25-03:26, 03:30- 03:31, 04:03:01- 04:03:02
94	145, 185 bp	515 bp	3, 7, 8, 9	*03:01:01-03:31
95⁶	210, 245 bp	430 bp	4	*04:01:01-04:06
96⁸	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 DQ low resolution SSP typings. 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.

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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 88 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 91, 92, 93 and 94 contain 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 split of the DQB1*05:05 to 05:08, DQB1*06:06 to 06:08 alleles, the DQB1*06:10 to 06:40, the DQB1*03:02:02-03:02:04, DQB1*03:03:03, DQB1*03:05:02 to 03:31 and the DQB1*04:03 to 04:06 alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

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 mixes 89 and 93 may give rise to primer dimer formation

⁶Primer mixes 91, 92, 93 and 95 may yield somewhat less intense specific PCR fragments than the other DQ low resolution primer mixes.

⁷Primer mix 93 may have tendencies of unspecific amplifications.

⁸Primer mix 96 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.

INTERPRETATION TABLE																						
HLA-A low resolution SSP typing																						
Amplification patterns of the A*01:01 to A*80:02 alleles																						
		Well ⁶																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Length of spec. PCR product(s)		120	210	205	190	135	175	165	75	85	80	185	175	100	90	240	140	200	160	220	240	70
		140	255	235		175	200	200			175		225	200	135	370	180		200	245	375	160
		225	365			210					500			240	205	395						240
			415																			495
Length of int.		800	800	1070	800	800	1070	800	800	1070	1070	800	1070	1070	1070	1070	1070	1070	800	800	800	800
pos. control ¹																						
5'-primer(s) ²		98	48	363	98	176	98	98	266	257	301	103	98	98	203	41	180	98	180	78	28	176
		5'-CTT	5'-gCT	5'-ATA	5'-CTA	5'-gCA	5'-CTC	5'-CTA	5'-ACg	5'-Cgg	5'-Cgg	5'-CCT	5'-CTT	5'-CAC	5'-gAA	5'-CTT	5'-TTT	5'-CAC	5'-TTT	5'-TCT	5'-TCg	5'-gCA
		103	78		413	368	368	102	266	259	302	423	423	238	362	355	203			106	261	261
		5'-CCT	5'-TCT		5'-CCg	5'-gTT	5'-gTT	5'-ACA	5'-ACg	5'-CgA	5'-ggA	5'-gCT	5'-gCT	5'-AgA	5'-ggT	5'-CCg	5'-gAA			5'-CCA	5'-AAC	5'-AAC
		123	106					413		261	385			355	363		418			245	1	341
		5'-AgT	5'-CCA					5'-CCg		5'-AAC	5'-ggC			5'-CCg	5'-ATA		5'-AgC			5'-CCT		5'-ggA
		363																				355
		5'-ATA																				5'-CCC
3'-primer(s) ³		203	240	527	256	270	259	259	302	299	341	257	282	257	299	238	290	256	299	265	97	292
		5'-TCT	5'-ggA	5'-CCA	5'-CTg	5'-ACA	5'-gTT	5'-gTT	5'-ggC	5'-TCg	5'-CgT	5'-gCA	5'-gAC	5'-gCA	5'-CCA	5'-CCT	5'-CAA	5'-CCC	5'-CCA	5'-CCC	5'-ggT	5'-gTg
		545	292	527	559	502	502	538			521	559	282	299	411	243	317	256	299	282	355	292
		5'-AgA	5'-gTg	5'-CCT	5'-CCg	5'-CTg	5'-CTT	5'-CCA			5'-ggg	5'-CTC	5'-gAC	5'-TCg	5'-TCA	5'-TCA	5'-ggA	5'-CTC	5'-CCA	5'-gAC	5'-gAC	5'-gTT
				555		538	539					559	559	418	526	265	555	259	341	282		299
				5'-gCA		5'-CAG	5'-TCT					5'-CgT	5'-CCg	5'-gTC	5'-CCA	5'-CCC	5'-CCA	5'-gTT	5'-CgT	5'-gAC		5'-TCT
				555										555		555				502		555
				5'-CCA										5'-CCA		5'-CCA				5'-CTT		5'-CCA
																				506		
																				5'-TgT		
Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

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Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
HLA-A allele ⁴	ser ⁵																					
*01:01:01:01:01:01:22, 01:01:24-01:04N, 01:06- 01:07, 01:09-01:11N, 01:16N-01:18N, 01:20, 01:22N-01:27N, 01:29, 01:31N-01:50, 01:52N- 01:78, 01:80-01:81, 36:04 ⁷	A1, A36, Null, –	1			4																	
*01:01:23, 01:08, 01:14- 01:15N, 01:30, 01:79, 36:01, 36:03, 36:05 ⁷	A1, A36, Null, –	1																				
*01:12, 01:19	A1, –	1		3																		
*01:13	A1	1			4						10		12		14							
*01:21	A1	1		3	4																	
*01:28	–	1			4						10				14							
*01:51	–	1			4			7		9												
*02:01:01:01:02:01:15, 02:01:17-02:01:19, 02:01:21- 02:16, 02:18-02:22:02, 02:24- 02:33, 02:36-02:45, 02:47, 02:49-02:54, 02:57-02:61, 02:63-02:69, 02:71-02:77, 02:79:01-02:97:02, 02:99, 02:101-02:102, 02:104- 02:128, 02:130-02:134, 02:136-02:145, 02:147- 02:168, 02:170-02:236, 02:238-02:242, 02:244- 02:282	A2, A19, Low A2, A203, A210, Null, –		2																			
*02:17:01-02:17:02	A2		2				w															
*02:34-02:35:01, 02:35:03, 02:56:01-02:56:02, 02:62, 02:103	A2		2										12							19		
*02:35:02	A2												12							19		
*02:46, 02:70	A2		2																	19		
*02:48, 02:129	A2, –																			19		
*02:55	A2, A28		2					7													20	21
*02:78	–		w		4															19		
*02:135	–		2										12									
*02:146	–		2								9											
*02:169	–		2		4																	
*02:237	–		2												13		15					
*02:243	–		2																17		20	
Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

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Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
*03:01:01:01-03:01:18, 03:01:20-03:01:22, 03:02- 03:07, 03:09-03:11N, 03:13- 03:17, 03:19-03:23, 03:25- 03:31, 03:33-03:35, 03:37- 03:40, 03:42, 03:44-03:49, 03:51-03:56, 03:58, 03:60- 03:62, 03:64-03:71, 03:73- 03:74, 03:76-03:81, 03:83- 03:87, 03:90-03:94, 03:96- 03:106, 03:109-03:110, 03:112	A3, Null, –			3									12									
*03:01:19	–			3								11	12									
*03:01:23, 03:08, 03:32, 03:36N, 03:57, 03:59, 03:72, 03:89, 03:107-03:108, 03:111, 24:92 ⁸	A3, Null, –			3																		
*03:12	A3			3	4																	
*03:18	–	1			4								12									
*03:24, 03:50	A3, –			3				7					12									
*03:41	–			3																		21
*03:43, 03:82	–			3									12		14		16					
*03:63	–			3								10	12									21
*03:75	–												12									21
*03:88	–			3	4							10										21
*03:95	–												12	13		15						
*11:01:01-11:09, 11:12- 11:24:02, 11:26-11:27, 11:29- 11:59, 11:61-11:80	A11, Null, –				4							10										
*11:10	A11				4			7				10										
*11:11	–				4							10	11									
*11:25, 11:60	A11, –			3	4							10										
*23:01:01-23:13, 23:15- 23:31, B*18:27	A23, Null, –					5																
*23:14, 24:05, 24:13:02, 24:24 ⁹	A23, A9, A24					5	6															
*24:02:01:01-24:04, 24:06- 24:11N, 24:13:01, 24:17, 24:20-24:23, 24:25-24:43, 24:45N-24:50, 24:54-24:56, 24:58-24:63, 24:66-24:81, 24:83N-24:91, 24:93, 24:95- 24:113, 24:115-24:137, 24:139-24:155N	A24, A9, Low A24, A 2403, Null, –					6																
Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

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Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
*24:18	A24, A3					6																21
*24:19, 24:44	A9					6				10												
*24:82	–					6															20	
*25:01:01-25:04, 25:07- 25:13	A25, Null, –							7	8				12									
*25:05	A25							7	8				12							19		
*25:06	A25							7	8			11										
*26:01:01-26:01:18, 26:08, 26:10-26:15, 26:17-26:18, 26:20, 26:23-26:29, 26:31- 26:33, 26:35-26:43:02, 26:45- 26:53, 26:55-26:56	A26, A10, Null, –							7		9			12									
*26:02	A26							7		9			w									
*26:03:01-26:03:02, 26:06, 26:21	A26, –							7			10		12									21
*26:04, 26:34	A26							7		9												
*26:05, 26:30	A26							7					12									21
*26:07:01-26:07:02	A26									9			12									
*26:09	A26							7		9		11										
*26:16	A26					6				9			12									
*26:19	–			4									12	13								
*26:22	A26							7		9			12	13							20	
*26:54	–							7		9			12							19		
*29:01:01:01-29:06, 29:08N- 29:12, 29:15-29:18, 29:20- 29:27	A29, Null, –													13								
*29:07	A29					5								13								
*29:13	–													13		16						
*29:14	–													13		15						
*29:19	–													13					18			
*30:01:01-30:04:02, 30:06- 30:07, 30:09-30:20, 30:22- 30:46	A30, Null, –														14							
*30:08	A30			4											14							
*31:01:02-31:02, 31:05- 31:28, 31:30-31:34, 31:36- 31:46	A31, A24, Null, –															15						
*31:03	A31										10	11		13		15						
*31:04	A31											11		13		15						
*31:29	–					5										15						
*31:35	–														14	15	16					
*32:01:01-32:02, 32:06- 32:14, 32:16-32:30	A32, Null, –							8									16					
*32:03	A32																16					
Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

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Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
*32:04	A32, A3			3					8													
*32:05	A32															15	16					
*32:15	A32							7	8								16					
*33:01:01-33:01:05, 33:03:01-33:12, 33:14- 33:18, 33:20-33:21, 33:23, 33:25-33:34	A33, –																	17				
*33:13	–									9				13				17				
*33:19	–					6												17				
*33:22	–																	17			20	
*33:24	–																	17				21
*34:01:01-34:01:02, 34:05- 34:06	A34, A10							7			10	11										
*34:02-34:03, 34:07	A34			3				7			10	11										
*34:04	A34			3				7			10	11		13								
*34:08	A34			3				7			10	11	12									
*34:09	–			3				7				11										
*36:01, 36:03, 36:05 ⁷	A36, –	1																				
*36:02	A36	1		3													16					21
*36:04	A36	1			4																	
*43:01	A43											11	12									
*66:01, 66:04-66:08, 66:10- 66:11, 66:13-66:15	A66, A26, –							7			10		12									
*66:02-66:03	A66, A10							7				11										
*66:09	–							7			10		12	13							20	
*66:12	–							7					12									
*68:01:01-68:04, 68:06- 68:14, 68:16-68:19, 68:21- 68:28, 68:30-68:44, 68:46- 68:65	A68, A28, Null, –							7												19		
*68:05, 68:15, 68:20	A68							7												19		21
*68:29	A68							7										17		19	20	
*68:45	–						6	7												19		
*68:66	–				4			7												19		
*69:01	A69							7													20	
*74:01-74:06, 74:08-74:12N, 74:14N	A74, Null, –																		18			
*74:07	A74																16		18			
*74:13	–												12						18			
*80:01	A80					5																21
*80:02	–					5					10											
HLA-A allele ⁴	ser ⁵																					
Well No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

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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 1070 base pairs, for most wells, or a band of 800 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-A low resolution SSP typing.

In addition, wells number 2, 4, 5, 7, 8, 11 and 18 to 21 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

²The nucleotide position, in the 1st, 2nd or 3rd exon or the 2nd intron, matching the specificity-determining 3'-end of the primer is given. 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 nucleotide position, in the 2nd or 3rd exon, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. 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 A*0105N has been shown to be identical to A*01:04N.

The A*020116 allele has been renamed to A*02:134.

The A*020120 has been renamed to A*02:01:18.

The sequence of the A*0223 allele has been shown to be identical to A*02:22.

The sequence of the A*0298 allele has been shown to be identical to A*02:96.

The A*1128 allele has been renamed to A*11:15:02.

The sequence of the A*2401 allele has been shown to be in error.

The sequence of the A*2412 allele has been shown to be identical to A*24:08.

The A*2416 allele has been renamed to A*31:08.

The A*2465 allele has been renamed to A*24:13:02.

The A*2644 allele has been renamed to A*26:43:02.

The sequence of the A*3005 allele has been shown to be identical to A*30:04.

The A*3021 allele has been renamed to A*30:11:02.

The sequence of the A*31011 allele has been shown to be identical to A*31:01:02.

The sequence of the A*3302 allele has been shown to be identical to A*33:03.

⁵The serological reactivity of all HLA-A alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

⁶The primer pairs in vial 2 will in many samples give rise to two specific PCR fragments.

⁷The A*36 alleles will give rise to identical amplification patterns as a number of A*01 alleles. These alleles can be separated by the A*01 and A*36 high resolution SSP primer sets.

⁸The A*03:01:23, 03:08, 03:32, 03:36N, 03:57, 03:59, 03:72, 03:89, 03:107-03:108, 03:111 and the A*24:92 alleles will give rise to identical amplification patterns. These alleles can be separated by the respective high resolution SSP primer sets.

⁹The A*23:14 and the A*24:05, 24:13:02 and 24:24 alleles will give rise to identical amplification patterns. These four alleles can be separated by the respective high resolution SSP primer sets. 'w', may be weakly amplified.

INTERPRETATION TABLE																																							
HLA-B low resolution SSP																																							
Amplification patterns of the B*07:02 to B*83:01 alleles																																							
		Well																																					
		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41																		
Length of spec. PCR product(s)		285	215	140	130	185	190	290	165	165	180	105	195	105	115	80	150	135	60	210	170																		
				235	265	235			220	190		195		395	150				245																				
									330	390				435					400																				
Length of int. pos. control ¹		800	1070	1070	800	800	800	1070	1070	1070	800	1070	1070	1070	1070	1070	800	1070	1070	800	800																		
5'-primer(s) ²		355	97	209	103	103	103	45	45	45	420	206	142	45	161	167	355	206	45	142	409																		
		5'-TCA 3'	5'-TCg 3'	5'-ggC 3'	5'-CCg 3'	5'-CCT 3'	5'-CCg 3'	5'-ggA 3'	5'-ggA 3'	5'-ggA 3'	5'-TTA 3'	5'-AgA 3'	5'-TCT 3'	5'-ggA 3'	5'-Cgg 3'	5'-gCT 3'	5'-TCA 3'	5'-gAC 3'	5'-ggA 3'	5'-TCT 3'	5'-ggC 3'																		
		363		363	103	363	418		357	435		420	419	540					368	368	420																		
		5'-AgC 3'		5'-AgC 3'	5'-CCg 3'	5'-AAT 3'	5'-Agg 3'		5'-Tgg 3'	5'-AAA 3'		5'-TTA 3'	5'-gTC 3'	5'-gAC 3'					5'-gTT 3'	5'-gTC 3'	5'-TTA 3'																		
				363	361				412										557																				
				5'-AgC 3'	5'-AgT 3'				5'-ATA 3'										5'-ggA 3'																				
3'-primer(s) ³		603	272	309	193	246	246	165	206	266	559	272	301	272	234	204	463	302	259	311	544																		
		5'-gTg 3'	5'-Tgg 3'	5'-gTg 3'	5'-CgT 3'	5'-TAT 3'	5'-TAT 3'	5'-Tgg 3'	5'-CCT 3'	5'-TCC 3'	5'-CTC 3'	5'-Tgg 3'	5'-gTC 3'	5'-TgC 3'	5'-TCT 3'	5'-TCT 3'	5'-gCT 3'	5'-ggC 3'	5'-gTT 3'	5'-ggg 3'	5'-ggT 3'																		
		605	272	559	193	246	572		538	559		572	301	309	272				259	311																			
		5'-gCT 3'	5'-TgA 3'	5'-CAG 3'	5'-CgT 3'	5'-TAT 3'	5'-GCC 3'		5'-gTC 3'	5'-CAG 3'		5'-gCg 3'	5'-gTC 3'	5'-ATC 3'	5'-TgA 3'				5'-gTT 3'	5'-ggg 3'																			
					583	559				583			570	605	272				266	538																			
					5'-gTg 3'	5'-CTC 3'				5'-gTg 3'			5'-CCg 3'	5'-gCT 3'	5'-Tgg 3'				5'-TCC 3'	5'-gTC 3'																			
													572						272																				
													5'-gCg 3'						5'-Tgg 3'																				
																			292																				
																			5'-gTA 3'																				
																			572																				
																			5'-gCg 3'																				
Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41																		

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INTERPRETATION TABLE																									
HLA-B low resolution SSP																									
Amplification patterns of the B*07:02 to B*83:01 alleles																									
Well																									
42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64			
110	395	160	180	105	325	115	130	90	90	145	120	430	145	300	160	180	180	90	95	115	360	350		Length of spec. PCR product(s)	
		425				195	270	410	175	430	210				330	210		240		150					
						225	260																		
1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	800	1070	1070	1070	1070	1070	1070	800	1070	1070	1070	1070	1070		Length of int. pos. control ¹
246	44	44	355	540	1 st I	355	209	41	209	48	357	49	206	1 st I	15	141	420	209	206	165	1 st I	1 st I		5'-primer(s) ²	
5'-gAA ^{3'}	5'-ggC ^{3'}	5'-ggC ^{3'}	5'-TCA ^{3'}	5'-gAC ^{3'}	5'-CAG ^{3'}	5'-TCA ^{3'}	5'-ggC ^{3'}	5'-CTg ^{3'}	5'-ggC ^{3'}	5'-gCC ^{3'}	5'-Tgg ^{3'}	5'-CAG ^{3'}	5'-gAA ^{3'}	5'-CAG ^{3'}	5'-gCA ^{3'}	5'-ATT ^{3'}	5'-TTA ^{3'}	5'-ggC ^{3'}	5'-gAC ^{3'}	5'-ACC ^{3'}	5'-CAG ^{3'}	5'-CAG ^{3'}			
		357	363			418	209	368	363	206					418	420		209		463					
		5'-Tgg ^{3'}	5'-Agg ^{3'}			5'-Agg ^{3'}	5'-ggg ^{3'}	5'-gTT ^{3'}	5'-AGC ^{3'}	5'-gAA ^{3'}					5'-Agg ^{3'}	5'-TTA ^{3'}		5'-ggA ^{3'}		5'-TgA ^{3'}					
						499	355											362							
						5'-TCT ^{3'}	5'-TCA ^{3'}											5'-ggT ^{3'}							
317	272	302	499	603	282	538	299	282	259	309	435	309	311	259	175	311	559	256	259	272	317	311		3'-primer(s) ³	
5'-ggA ^{3'}	5'-TgC ^{3'}	5'-ggC ^{3'}	5'-ggA ^{3'}	5'-gTg ^{3'}	5'-gCC ^{3'}	5'-gTC ^{3'}	5'-TCA ^{3'}	5'-gCC ^{3'}	5'-gTT ^{3'}	5'-ATC ^{3'}	5'-TCT ^{3'}	5'-ATC ^{3'}	5'-ggT ^{3'}	5'-CTC ^{3'}	5'-CCg ^{3'}	5'-ggT ^{3'}	5'-CAG ^{3'}	5'-CCC ^{3'}	5'-gTT ^{3'}	5'-TgC ^{3'}	5'-ggA ^{3'}	5'-ggT ^{3'}			
		302		605		572	583	418	499		527			259	538	559		259		538					
		5'-ggT ^{3'}		5'-gCT ^{3'}		5'-gCg ^{3'}	5'-gTg ^{3'}	5'-gTC ^{3'}	5'-ggA ^{3'}		5'-CCT ^{3'}			5'-CTC ^{3'}	5'-gTC ^{3'}	5'-CgT ^{3'}		5'-CTT ^{3'}		5'-CCA ^{3'}					
		477												262				559							
		5'-gCg ^{3'}																5'-CgT ^{3'}							

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Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HLA-B allele ⁴	ser. ¹¹																				
*07:02:01-07:02:20, 07:05:01-07:06, 07:09-07:15, 07:17- 07:18:02, 07:21- 07:23, 07:26, 07:29- 07:31, 07:34-07:35, 07:39, 07:41-07:46, 07:48-07:49N, 07:51- 07:52, 07:55-07:59, 07:61-07:64, 07:66- 07:68:02, 07:70- 07:72, 07:74-07:76, 07:79-07:80, 07:82- 07:83, 07:86-07:99, 07:101-07:117	B7, B42, Null, –	22																			
*07:03, 07:08, 07:16, 07:32, 07:37	B703, B7, –	22																			
*07:04, 07:25	B7	22												34							
*07:07, 07:19, 07:33, 07:40, 07:53, 07:77	B7, 42, –																				
*07:20, 07:24	B7, blank	22		24																	
*07:27	–	22										32								40	
*07:28	B7	22					27														
*07:36, 07:81	B7, –	22																			
*07:38	–	22																			
*07:47	B7	22																			
*07:50	–	22										32									
*07:54	B7	22																			
*07:60	–			24																	
*07:65	–	22																	38		
*07:69, 07:85	–	22																			
*07:73	–	22														36					
*07:78	–										31										
*07:84	–																				
*07:100	–			24																	
*08:01:01-08:01:13, 08:05, 08:08N, 08:10- 08:11, 08:15, 08:18- 08:19N, 08:22-08:24, 08:27, 08:29-08:31, 08:33-08:35, 08:39, 08:41-08:48, 08:51, 08:53, 08:56-08:59, 08:61, 08:63-08:64, 08:66	B8, Null, –	22	23						29												
Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

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42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64		Well No.
																							ser. ¹¹	HLA-B allele ⁴
		44			47																	64	B7, B42, Null, –	*07:02:01-07:02:20, 07:05:01-07:06: 07:09-07:15, 07:17- 07:18:02, 07:21- 07:23, 07:26, 07:29- 07:31, 07:34-07:35, 07:39, 07:41-07:46, 07:48-07:49N, 07:51- 07:52, 07:55-07:59, 07:61-07:64, 07:66- 07:68:02, 07:70- 07:72, 07:74-07:76, 07:79-07:80, 07:82- 07:83, 07:86-07:99, 07:101-07:117
		44																				64	B703, B7, –	*07:03, 07:08, 07:16, 07:32, 07:37
		44		46	47																	64	B7	*07:04, 07:25
		44			47																	64	B7, 42, –	*07:07, 07:19, 07:33, 07:40, 07:53, 07:77
		44			47																	64	B7, blank	*07:20, 07:24
																				63		–	*07:27	
		44			47																	64	B7	*07:28
					47																63	B7, –	*07:36, 07:81	
																					63	–	*07:38	
		44			w																	64	B7	*07:47
		44																				64	–	*07:50
		44			47									56								64	B7	*07:54
		44			47																	64	–	*07:60
					47			50								58			w			64	–	*07:65
	43	44																				64	–	*07:69, 07:85
		44			47																	64	–	*07:73
		44			47						53											64	–	*07:78
		44			47						53											64	–	*07:84
		44			47															62		64	–	*07:100
		44			46																	64	B8, Null, –	*08:01:01-08:01:13, 08:05, 08:08N, 08:10 08:11, 08:15, 08:18- 08:19N, 08:22-08:24, 08:27, 08:29-08:31, 08:33-08:35, 08:39, 08:41-08:48, 08:51, 08:53, 08:56-08:59, 08:61, 08:63-08:64, 08:66
42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64		Well No.

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Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
*08:02-08:03, 08:52	B8, –	22	23						29												
*08:04	B8, –	22	23						29			32									
*08:07, 08:14, 08:28, 08:37	B8, –	22	23																		
*08:09, 08:12:01-08:12:03, 08:16	B8		23						29												
*08:13, 08:20, 08:40	B8, –	22	23																		
*08:17, 08:54	–	22	23						29			32									
*08:21	B8	22	23	24					29												
*08:25	B8	22	23	24																	
*08:26, 08:50, 08:62, 42:07 ⁵	B8, –	22							29												
*08:32	B8	22	23						29									38			
*08:36	–	22	23						29												
*08:38	–	22	23						29												
*08:49	–	22	23														37		40		
*08:55	–	22	23																	41	
*08:60	–	22	23						29												
*08:65	–	22							29												
*13:01:01-13:01:05, 13:17, 13:20, 13:22:01-13:23, 13:25, 13:28-13:29	B13, –			24	25						31						37				
*13:02:01-13:02:09, 13:08Q, 13:11, 13:15, 13:18-13:19, 13:27, 13:30, 13:32-13:34, 13:37-13:38, 13:40	B13, –			24	25						31										
*13:03	B49, B15			24	25																
*13:04, 13:10, 13:21, 13:35	B49, B15, B13, –			24	25																
*13:06	B13			24	25												37				
*13:07N	Null			24	25						31						37				
*13:09	–				25						31										
*13:12-13:13, 13:26	B13, –			24	25												37				
*13:14	B13			24							31										
*13:16	B13			24	25						31										
*13:31	–			24	25						31										
*13:36	–			24	25						31						37				
*13:39	–				25						31						37				
*14:01:01-14:01:02, 14:07N, 14:12, 14:14, 14:19	B64, –, Null				25	26															
*14:02:01-14:02:02, 14:02:04, 14:03-14:04, 14:09, 14:11, 14:15-14:18	B65, B14, –				25		27														
Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

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42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	Well No.	
				46																	63		B8, –	*08:02-08:03, 08:52
		44		46																		64	B8, –	*08:04
		44		46																		64	B8, –	*08:07, 08:14, 08:28, 08:37
		44		46																		64	B8	*08:09, 08:12:01-08:12:03, 08:16
		44																				64	B8, –	*08:13, 08:20, 08:40
		44		46										56								64	–	*08:17, 08:54
		44		46																		64	B8	*08:21
		44																				64	B8	*08:25
		44		46																		64	B8, –	*08:26, 08:50, 08:62, 42:07 ⁵
		44		46															61			64	B8	*08:32
				46																		64	–	*08:36
		44		46										56								64	–	*08:38
		44		46		48																64	–	*08:49
		44																				64	–	*08:55
		44		46		48																64	–	*08:60
	43	44		46																		64	–	*08:65
														56								63	B13, –	*13:01:01-13:01:05, 13:17, 13:20, 13:22:01-13:23, 13:25, 13:28-13:29
														56								63	B13, –	*13:02:01-13:02:09, 13:08Q, 13:11, 13:15, 13:18-13:19, 13:27, 13:30, 13:32-13:34, 13:37-13:38, 13:40
														56			59					63	B49, B15	*13:03
														56								63	B49, B15, B13, –	*13:04, 13:10, 13:21, 13:35
														56		58						63	B13	*13:06
														56								63	Null	*13:07N
														56								64	–	*13:09
														56								63	B13, –	*13:12-13:13, 13:26
														56								63	B13	*13:14
											53			56								63	B13	*13:16
											w			56						62	63	–	*13:31	
									51													63	–	*13:36
														56								64	–	*13:39
	43	44																				64	B64, – Null	*14:01:01-14:01:02, 14:07N, 14:12, 14:14, 14:19
	43	44																				64	B65, B14, –	*14:02:01-14:02:02, 14:02:04, 14:03-14:04, 14:09, 14:11, 14:15-14:18
42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	Well No.	

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Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
*14:02:03, 14:02:06	B65, –				25																
*14:02:05	B65				25		27														
*14:05-14:06:02, 14:13	B14, –						27														
*14:08, 39:25N, 39:30, 39:32-39:34, 39:43, 39:47, 39:50 ⁶	B39, B16, Null, –					26															
*14:10	–					26											37				
*15:01:01:01-15:01:01:02N, 15:01:03, 15:01:06-15:01:16, 15:01:18, 15:01:20, 15:26N-15:27:03, 15:30, 15:32, 15:34-15:35, 15:38:01-15:38:02, 15:50, 15:56, 15:58, 15:60, 15:63, 15:70-15:71, 15:75, 15:79N, 15:81-15:82, 15:92, 15:94N, 15:96-15:97, 15:102, 15:104-15:105, 15:109-15:111N, 15:113, 15:117-15:118, 15:122, 15:125, 15:128-15:129, 15:135, 15:140, 15:145-15:147, 15:152, 15:159-15:160, 15:163-15:164, 15:166-15:167, 15:169, 15:171-15:172, 15:174-15:175, 15:178, 15:181N-15:184, 15:187, 15:190N, 15:192-15:193, 15:201, 15:203, 15:206	B62, Null, –							28											39		
*15:01:02	B62							28		30									39		
*15:01:04	B62																		39		
*15:01:17, 15:05:01-15:06, 15:33, 15:39:01-15:40, 15:48, 15:65, 15:78:01-15:78:02, 15:84, 15:107, 15:136, 15:138, 15:141, 15:150, 15:155, 15:179, 15:185, 15:188, 15:195, 15:199	B62, –							28											39		
*15:01:19, 15:28, 15:120, 15:149N	B62, Null, –							28											39		
Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

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42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64		Well No.
	43	44																				64	B65, –	*14:02:03, 14:02:06
	43																					64	B65	*14:02:05
	43	44																				64	B14, –	*14:05-14:06:02, 14:13
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*78:05	–									30								38			
*78:06	–									30											
*81:01	B81	22																			
*81:02	B81	22																			
*81:03-81:05	Null,	22																			
*82:01-82:03	B82, –							29			32							39			
*83:01	–																37				
Well No.		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HLA-B allele ⁴	ser. ¹¹																				

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Lot-specific Information

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42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	Well No.	
												54						60			63		B57, Null, –	*57:01:01-57:01:04, 57:01:06-57:03:02, 57:05-57:06, 57:08, 57:10, 57:15-57:20, 57:22-57:23, 57:25-57:30, 57:32-57:37
												54						60			63		B57, –	*57:01:05, 57:11, 57:13, 57:21, 57:31
												54						60			63		B57	*57:04
						48						54						60			63		B57, –	*57:07, 57:24
						48						54						60			63		B57	*57:09
																		60			64		B57	*57:12
							49					54						60			63		–	*57:14
												54									63		B58, Null, –	*58:01:01-58:01:02, 58:01:04-58:01:08, 58:04-58:05, 58:10N-58:15, 58:19, 58:21-58:24, 58:28-58:31N
												54									63		B58, –	*58:01:03, 58:02, 58:06, 58:16, 58:25-58:27
												54									63		B58	*58:07
											53	54									63		B17, B5	*58:08
							49					54									63		B17	*58:09
												54									63		Null	*58:17N
												54									63		–	*58:18
												54									63		–	*58:20
										52						58					63		B59, –	*59:01, 59:05
										52											63		B59, –	*59:02-59:03
										52							59				63		–	*59:04
		44				47															64		B67, –	*67:01:01, 67:03
		44				47															64		B67, –	*67:01:02-67:02
		44				47															62	64	B73, –	*73:01-73:02
											53					58			61		64		B78, –	*78:01, 78:02:02-78:03, 78:07
											53								61		64		B78, B35	*78:02:01, 78:04
											53			56							64		–	*78:05
											53			56							64		–	*78:06
					47			50	51												64		B81	*81:01
		44			47				51												64		B81	*81:02
					47				51												64		Null,	*81:03-81:05
					47			50									59				64		B82, –	*82:01-82:03
					47	48		50							57						64		–	*83:01
42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	Well No.	
																							ser. ¹¹	HLA-B allele ⁴

Lot No.: **65K**

Lot-specific Information

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Well No.	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
A*23:31, A*24:106, C*16:10						27														
A*68:56, C*06:20, C*12:50																				
C*01:30				25																
C*03:05, 03:25, 03:27			24																	
C*03:12, 03:19																				
C*03:102																37				
C*07:46								29												
C*15:02:04																				
C*15:25																				
C*15:39																				
Well No.	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

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 1070 base pairs, for most wells, or a band of 800 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-B low resolution typing.

In addition, wells number 26, 27, 31, 37, 40, 41, 53 and 60 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

²The nucleotide position, in the 1st, 2nd or 3rd exon or in the 1st intron, matching the specificity-determining 3'-end of the primer is given. 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 nucleotide position, in the 2nd or 3rd exon, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. 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 B*0701 allele has been shown to be in error.

The sequence of the B*13:05 allele has been shown to be identical to B*13:04.

The B*13:24 allele has been renamed B*13:22:02

The B*15:01:05 allele has been corrected and renamed B*15:120

The B*15:22 allele has been renamed B*35:43.

The sequence of the B*15:41 allele has been shown to be identical to B*15:39.

The B*15:59 allele has been renamed B*35:44.

The sequence of the B*18:16 allele has been shown to be identical to B*18:14.

The sequence of the B*27:051 allele has been shown to be identical to B*27:05:02.

The sequence of the B*27:22 allele has been shown to be identical to the corrected B*27:06 sequence.

The B*35:73 allele has been renamed B*35:08:03.

The sequence of the B*39:012 allele has been shown to be identical to B*39:01:01.

The sequence of the B*39:21 allele has been shown to be identical to B*39:24.

The sequence of the B*40:17 allele has been shown to be identical to B*40:16.

The sequence of the B*40:41 allele has been shown to be identical to B*40:40.

The sequence of the B*42:03 allele has never been assigned.

The sequence of the B*44:01 allele has been shown to be identical to B*44:02.

The sequence of the B*50:03 allele has been shown to be identical to B*50:02.

The sequence of the B*51:25 allele has been shown to be identical to B*51:22.

The B*51:47 allele has been renamed B*51:09:02.

The sequence of the B*55:06 allele has been shown to be identical to B*55:04.

The sequence of the B*58:03 allele has never been assigned.

The B*79:01 allele has been renamed B*15:18.

The B*9530 allele has been renamed B*15:27:02.

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Lot-specific Information

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42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	Well No.
																							A*23:31, A*24:106, C*16:10
																				62			A*68:56, C*06:20, C*12:50
																							C*01:30
																							C*03:05, 03:25, 03:27
																59							C*03:12, 03:19
																59							C*03:102
																							C*07:46
																58							C*15:02:04
						48																	C*15:25
							49																C*15:39
42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	Well No.

⁵The B*08:26, 08:50, 08:62 and the B*42:07 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

⁶The B*14:08 and the B*39:25N, 39:30, 39:32-39:34, 39:43, 39:47 and 39:50 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

⁷The B*18:29 and the B*35:09:01-35:09:02, 35:18, 35:31-35:32, 35:37, 35:53N, 35:64, 35:68:01-35:68:02, 35:75, 35:88, 35:99, 35:118-35:119, 35:127 and 35:151 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

⁸The B*41:09 and the B*45:02-45:03 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

⁹The B*55:02:01-55:02:06, 55:07, 55:10, 55:12, 55:16, 55:19, 55:26, 55:30, 55:37, 55:39, 55:41-55:43, 55:47-55:48 and the B*56:10 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

¹⁰The B*55:04, 55:08, 55:13, 55:23, 55:27, 55:32, 55:46 and the B*56:15, 56:18-56:19N and 56:22 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

¹¹The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

‘ser’, serological HLA specificity.

‘w’, might be weakly amplified.

‘?’, nucleotide sequence information not available for the primer matching sequence.

CE
0088

Lot No.: **65K**

Lot-specific Information

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Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
DRB1 allele ⁴	ser ⁵																							
*01:01:01-01:02:05, 01:04-01:34	DR1, Null, –	65																						
*01:03	DR103	66																						
*03:01:01:01-03:01:09, 03:04-03:06, 03:09, 03:11:01-03:16, 03:18-03:20, 03:22-03:23, 03:25-03:26, 03:28, 03:30-03:31, 03:33-03:34, 03:36-03:37, 03:43-03:45, 03:47-03:48, 03:50-03:52, 03:54-03:58	DR17, DR3, –					69	70											81						
*03:02:01-03:03, 03:27, 03:29, 03:38, 03:53	DR18, DR3, –					69	71											81						
*03:07, 03:17, 03:21, 03:24, 03:32, 03:35, 03:39-03:41, 03:49	DR3, –					69												81						
*03:08	DR3					69	70				75	77												
*03:10	DR3					69	70												83	84				
*03:42	–					69																		
*03:46	–					69	70																	
*04:01:01-04:61, 04:63-04:68, 04:70-04:72:02, 04:74-04:92	DR4, DR3, Null, –								72															
*04:62, 04:69, 04:73	DR4, –								72									82						
*07:01:01-07:01:03, 07:03-07:19	DR7, Null, –									73														
*08:01:01-08:02:03, 08:04:01-08:07, 08:11, 08:16-08:17, 08:22, 08:24, 08:26, 08:28, 08:39	DR8, –										74						80							
*08:03:02, 08:10, 08:12-08:15, 08:18-08:19, 08:23, 08:25, 08:27, 08:29-08:30:02, 08:33-08:34, 08:36-08:38	DR8, –										74													
*08:08	DR8										74						80	82						
*08:09, 14:15	DR8										74						80			84				
*08:20, 13:18, 13:47, 13:55	DR13, –															79	80	81		84				
*08:21	DR8										74					79	80			84				
*08:31, 08:41, 11:67	DR8, DR11, –										74			77			80							
*08:32	–										74			78						84				
*08:35	–										74									84				
*08:40	–						70				74													
Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87

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Lot-specific Information

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Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
*09:01:02-09:01:05, 09:01:07-09:02:02, 09:04- 09:09	DR9, –											75							83					
*09:01:06, 09:03	DR9											75												
*10:01:01-10:03	DR10, –											76												
*11:01:01-11:01:12, 11:04:01-11:04:06, 11:06:01- 11:06:02, 11:09-11:10:02, 11:12:01-11:12:02, 11:15, 11:24, 11:27:01-11:30, 11:32-11:33, 11:35, 11:37- 11:39, 11:43-11:44, 11:46- 11:47, 11:49-11:51, 11:54:01-11:54:02, 11:56, 11:58:01-11:58:02, 11:60- 11:62, 11:66, 11:72, 11:74- 11:75, 11:77-11:78, 11:81, 11:84, 11:88, 11:90-11:92, 11:94-11:95, 11:97	DR11, –													77		79	80							
*11:02:01-11:03, 11:11:01- 11:11:02, 11:14:01- 11:14:02, 11:16, 11:20- 11:21, 11:36, 11:40-11:41, 11:48, 11:59, 11:63, 11:65:01-11:65:02, 11:68, 11:70, 11:76, 11:80, 11:83, 11:85-11:87, 11:93	DR11, DR13, –						70							77		79	80							
*11:05	DR11													77			80							
*11:07, 11:53	DR11					69						75		77										
*11:08:01-11:08:02, 11:18- 11:19:02, 11:42, 11:57	DR11													77		79								
*11:13:01-11:13:02	DR11							w						77					83	84				
*11:17, 11:52	DR14, DR11													77					83	84				
*11:22, 11:98	–													77										
*11:23, 11:25, 11:96	DR11, –													77		79	80			84				
*11:26, 11:34	DR11							71						77										
*11:31, 11:45, 11:64	DR11, –													77		79				84				
*11:55	DR11													77			80			84				
*11:69, 11:82	–													77			80		82					
*11:73, 11:79	–						70							77		79								
*11:89	–													77						84				
Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87

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Lot-specific Information

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Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
*12:01:01-12:01:03, 12:03:02, 12:05-12:12, 12:14, 12:17, 12:24N-12:25	DR12, –, Null														78									
*12:02:01-12:02:05, 12:13, 12:15, 12:18-12:21, 12:23, 12:26	DR12, –														78		80							
*12:04	DR12										74				78									
*12:16	–										74				78		80							
*12:22	–										73	74			78									
*13:01:01-13:02:01, 13:02:03-13:02:04, 13:04, 13:08, 13:16, 13:20, 13:22- 13:24, 13:27-13:29, 13:31- 13:32, 13:34-13:36, 13:38- 13:41, 13:48, 13:51-13:52, 13:54, 13:59, 13:61, 13:63- 13:65, 13:68-13:76, 13:78- 13:80, 13:83-13:84, 13:87, 13:91-13:93, 13:96-13:99, 13:102	DR11, DR13, DR14, –						70									79	80	81						
*13:02:02, 13:03:01- 13:03:06, 13:10, 13:33:01- 13:33:03, 13:37, 13:66:01- 13:66:02, 13:81, 13:88- 13:90, 13:94-13:95, 13:101	DR13, –						70									79		81						
*13:05:01-13:05:02, 13:07:01-13:07:02, 13:11:01- 13:11:02, 13:14:01- 13:14:03, 13:21:01- 13:21:02, 13:42, 13:46, 13:49-13:50:02, 13:62, 13:100	DR13, DR11, DR6, –															79	80	81						
*13:06, 13:12, 13:25, 13:30, 13:56, 13:58, 13:60, 13:77, 13:82	DR11, DR13, DR6, –															79		81						
*13:09	DR13																80	81						
*13:13, 14:84	DR13, –															79		81		84				
*13:15, 13:19, 13:53, 13:57	DR13						70	71								79	80	81						
*13:17	DR13						70				73						80							
*13:26	DR14							71								79	80	81						
*13:43	DR13						70									79	80			83	84			
*13:44, 13:86	–							71										81						
*13:45	DR13						70									79	80		82		84			
*13:67, 13:103	DR13, –															79	80							
*13:85	–						70	71								79		81						
Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87

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Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
*14:01:01-14:01:02, 14:04, 14:07:01-14:07:02, 14:10, 14:26, 14:28, 14:31, 14:35, 14:38-14:39, 14:54-14:55, 14:57, 14:60-14:62, 14:70-14:71, 14:75-14:76, 14:79, 14:86-14:88, 14:90, 14:99	DR14, DR 1404, DR4, DR6, –																		82	83	84			
*14:01:03, 14:08, 14:23:02, 14:34, 14:72, 14:92N, 14:97	DR14, Null, –																			83	84			
*14:02, 14:06:01-14:06:02, 14:09, 14:13, 14:17, 14:20, 14:29-14:30, 14:33, 14:41, 14:47-14:48, 14:51, 14:80, 14:83, 14:94	DR14, DR6, –							71										81		83				
*14:03:01-14:03:02, 14:12:01-14:12:02, 14:40, 14:63, 14:67, 14:77-14:78, 14:85	DR 1403, DR14, DR6, –							71							79			81			84			
*14:05:01-14:05:03, 14:14, 14:23:01, 14:23:03, 14:36, 14:43-14:45, 14:56, 14:59, 14:64, 14:91, 14:96, 14:100	DR14, –																	81		83	84			
*14:11	DR14										74									83	84			
*14:16	DR6						70								79	80			82	83	84			
*14:18, 14:81	DR14, –							71										81		83	84			
*14:19, 14:21	DR14						70	71							79			81		w				
*14:22	DR14														79	80			82	83	84			
*14:24	DR14							71								80		81						
*14:25, 14:53	DR6, DR14														79	80			82		84			
*14:27	DR14							71							79	80		81			84			
*14:32:01-14:32:02	DR14							w											82	83	84			
*14:37	DR14															80		81	82					
*14:42	–																	81			84			
*14:46, 14:52	DR14																			83				
*14:49	DR14							71											82	83	84			
*14:50	DR14										73								82	83	84			
*14:58	DR14																		82		84			
*14:65	DR6							w										81		83	84			
*14:68, 14:93	DR14, –										74								82	83	84			
*14:69	–														79				82		84			
*14:73	–															80			82	83	84			
*14:74	–														79				82	83	84			
*14:82	–							70											82	83	84			
*14:89	–								71									81			84			
Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87

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Well No.	DR	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
*14:95	–					70												81		83	84			
*14:98	–					71										79		81						
*15:01:01:01-15:20, 15:22-15:24, 15:26, 15:28-15:33, 15:35-15:49, 15:51	DR15, DR2, Null, –			67																				
*15:21	DR2			67																w				
*15:25	–			67		69																		
*15:27, 15:34	–			67																83				
*15:50N	Null			w																				
*16:01:01-16:03, 16:05:01-16:05:02, 16:07-16:17	DR16, Null, –				68																			
*16:04	DR16				68															w				
Well No.		65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
DRB1 allele ⁴	ser ⁵																							
DRB3*01:01:02:01-01:14, DRB3*02:01:02:25, DRB3*03:01:01-03:03	DR52, –																					85		
DRB4*01:01:01:01-01:03:01:01, DRB4*01:03:02:01:08	DR53, –																						86	
DRB4*01:03:01:02N	Null																			82			86	
DRB5*01:01:01-01:14, DRB5*02:02-02:05	DR51, Null, –																							87
Well No.	ser ⁵	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87

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 65 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 74 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 or the 1st intron, 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. Empty spaces indicate codon boundaries.

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. Empty spaces indicate codon boundaries.

⁴The DRB1*08:09 and the DRB1*14:15 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The DRB1*08:20 and the DRB1*13:18, 13:47 and 13:55 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The DRB1*08:31, 08:41 and DRB1*11:67 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The DRB1*13:13 and DRB1*14:84 alleles yield identical amplification patterns with the DR low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The sequence of the DRB1*0702 allele has been shown to be identical to DRB1*07:01:01. The sequence of the DRB1*08031 allele has been shown to be identical to DRB1*08:03:02. The sequence of the DRB1*09011 allele has been shown to be identical to DRB1*09:01:02. The sequence of the DRB1*12031 allele has been shown to be identical to DRB1*12:01. The sequence of the DRB1*1466 allele has been shown to be identical to DRB1*14:23:02. The sequence of the DRB1*1606 allele has been shown to be identical to DRB1*16:05. The sequence of the DRB3*010101 allele has been shown to be identical to DRB3*01:01:02:01. The DRB4*0101102N allele has been renamed DRB4*01:03:01:02N. The sequence of the DRB5*0201 allele has been shown to be identical to DRB5*02:02. The sequence of the DRB5*0201 allele has been shown to be identical to DRB5*02:02.

⁵The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

'ser', serological HLA specificity. 'w', may be weakly amplified. '?', nucleotide sequence information for the primer matching region(s) is not known.

INTERPRETATION TABLE										
DQ low resolution SSP typing										
Amplification patterns of the DQB1*05:01 to DQB1*04:06 alleles										
		Well⁶								
		88	89	90	91	92	93	94	95	96
Length of spec. PCR product(s)		225	220	210	220	130	135	145	210	Negative control
			270					185	245	
Length of int. pos. control¹		515	430	430	515	515	515	515	430	
5'-primer(s)²		26(173)	9(122)	30(185)	26(173)	28(179)	26(173)	38(210)	9(122)	
		5' -ggg 3'	5' -gTT 3'	5' -AAg 3'	5' -TTA 3'	5' -gAC 3'	5' -TCT 3'	5' -gCA 3'	5' -gTT 3'	
			26(173)			28(179)		48(240)	21(159)	
			5' -TTA 3'			5' -gAC 3'		5' -CgC 3'	5' -ACC 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)	Negative control
		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.		88	89	90	91	92	93	94	95	96
DQB1 allele⁴	ser.⁵									
*05:01:01-05:08	DQ5, –	88								Negative control
*06:01:01-06:28, 06:30-06:40	DQ6, DQ5, DQ1, Null, –		89							
*06:29	DQ6		89			92				
*02:01:01-02:02, 02:04-02:05	DQ2, –			90						
*02:03	DQ2			90			93			
*03:01:01-03:01:05, 03:04, 03:09-03:10, 03:13-03:14, 03:16, 03:19, 03:21-03:22, 03:24, 03:27-03:29	DQ7, DQ3, –				91			94		
*03:02:01-03:02:05, 03:05:01-03:05:04, 03:07-03:08, 03:11, 03:18	DQ8, –					92		94		
*03:03:02-03:03:03, 03:06, 03:12, 03:15, 03:20, 03:25-03:26, 03:30-03:31	DQ9, DQ3, –						93	94		
*03:17, 03:23	DQ9, –							94		
*04:01:01-04:02:02, 04:04-04:06	DQ4, –								95	
*04:03:01-04:03:02	–						93		95	
DQB1 allele⁴	ser.⁵									
Well No.		88	89	90	91	92	93	94	95	96

Lot No.: **65K**

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 88 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 91, 92, 93 and 94 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. Empty spaces indicate codon boundaries.

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. Empty spaces indicate codon boundaries.

⁴The sequence of the DQB1*030301 allele has been shown to be identical to DQB1*03:03:02.

⁵The serological split of the DQB1*05:05 to 05:08, DQB1*06:06 to 06:08 alleles, the DQB1*06:10 to 06:40, the DQB1*03:02:02-03:02:04, DQB1*03:03:03, DQB1*03:05:02 to 03:31 and the DQB1*04:03 to 04:06 alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

⁶Primer mix 96 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.

CELL LINE VALIDATION SHEET															
HLA-A low resolution primer set															
						Well									
						1	2	3	4	5	6	7	8	9	10
					Lot No.:	201078701	201078702	201073303	201073304	201078706	201073307	201073308	201073309	201078710	201078711
						201073312	201073313	201078714	201073315	201078716					
	IHWC cell line	A*	A*												
1	9001 SA	*24:02				-	-	-	-	-	+	-	-	-	-
2	9280 LK707	*02:01				-	+	-	-	-	-	-	-	-	-
3	9011 E4181324	*01:01				+	-	-	+	-	-	-	-	-	-
4	9275 GU373	*30:01				-	-	-	-	-	-	-	-	-	+
5	9009 KAS011	*01:01				+	-	-	+	-	-	-	-	-	-
6	9353 SM	*02:01	*26:03			-	+	-	-	-	-	+	-	-	-
7	9020 QBL	*26:01				-	-	-	-	-	-	+	-	-	-
8	9025 DEU	*31:01				-	-	-	-	-	-	-	-	-	+
9	9026 YAR	*26:01				-	-	-	-	-	-	+	-	-	-
10	9107 LKT3	*24:02				-	-	-	-	-	+	-	-	-	-
11	9051 PITOUT	*29:02				-	-	-	-	-	-	-	-	-	+
12	9052 DBB	*02:01				-	+	-	-	-	-	-	-	-	-
13	9004 JESTHOM	*02:01				-	+	-	-	-	-	-	-	-	-
14	9071 OLGA	*31:01				-	-	-	-	-	-	-	-	-	-
15	9075 DKB	*24:02				-	-	-	-	-	+	-	-	-	-
16	9037 SWEIG007	*29:02				-	-	-	-	-	-	-	-	-	+
17	9282 CTM3953540	*03:01	*80:01			-	-	+	-	+	-	-	-	-	+
18	9257 32367	*33:03	*74:01			-	-	-	-	-	-	-	-	-	-
19	9038 BM16	*02:01				-	+	-	-	-	-	-	-	-	-
20	9059 SLE005	*02:01				-	+	-	-	-	-	-	-	-	-
21	9064 AMALA	*02:17				-	+	-	-	-	W	-	-	-	-
22	9056 KOSE	*02:01				-	+	-	-	-	-	-	-	-	-
23	9124 IHL	*02:01	*34:01			-	+	-	-	-	-	+	-	+	-
24	9035 JBUSH	*32:01				-	-	-	-	-	-	-	-	-	-
25	9049 IBW9	*33:01				-	-	-	-	-	-	-	-	-	-
26	9285 WT49	*02:05				-	+	-	-	-	-	-	-	-	-
27	9191 CH1007	*24:10	*29:01			-	-	-	-	-	+	-	-	-	+
28	9320 BEL5GB	*02:01	*29:02			-	+	-	-	-	-	-	-	-	+
29	9050 MOU	*29:02				-	-	-	-	-	-	-	-	-	+
30	9021 RSH	*30:01	*68:02			-	-	-	-	-	-	+	-	-	+
31	9019 DUCAF	*30:02				-	-	-	-	-	-	-	-	-	+
32	9297 HAG	*02:01				-	+	-	-	-	-	-	-	-	-
33	9098 MT14B	*31:01				-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*31:01				-	-	-	-	-	-	-	-	-	-
35	9302 SСТО	*32:01				-	-	-	-	-	-	-	+	-	-
36	9024 KT17	*02:06	*11:01			-	+	-	+	-	-	-	-	+	-
37	9065 HHKB	*03:01				-	-	+	-	-	-	-	-	-	+
38	9099 LZL	*02:17				-	+	-	-	-	W	-	-	-	-
39	9315 CML	*01:01	*03:01			+	-	+	+	-	-	-	-	-	+
40	9134 WHONP199	*02:07	*30:01			-	+	-	-	-	-	-	-	-	+
41	9055 H0301	*03:01				-	-	+	-	-	-	-	-	-	+
42	9066 TAB089	*02:07				-	+	-	-	-	-	-	-	-	-
43	9076 T7526	*02:06	*02:07			-	+	-	-	-	-	-	-	-	-
44	9057 TEM	*66:01				-	-	-	-	-	-	+	-	+	-
45	9239 SHJO	*23:01	*24:02			-	-	-	-	+	+	-	-	-	-
46	9013 SCHU	*03:01				-	-	+	-	-	-	-	-	-	+
47	9045 TUBO	*02:16	*03:01			-	+	+	-	-	-	-	-	-	+
48	9303 TER-ND	*02:01	*11:01			-	+	-	+	-	-	-	-	+	-

Lot No.: **65K**

Lot-specific Information

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CELL LINE VALIDATION SHEET											
HLA-A low resolution primer set											
					Well						
					16	17	18	19	20	21	
				Lot No.:	201078717	201073318	201073319	201078720	201073321	201078723	
	IHCW cell line		A*	A*							
1	9001	SA	*24:02		-	-	-	-	-	-	
2	9280	LK707	*02:01		-	-	-	-	-	-	
3	9011	E4181324	*01:01		-	-	-	-	-	-	
4	9275	GU373	*30:01		-	-	-	-	-	-	
5	9009	KAS011	*01:01		-	-	-	-	-	-	
6	9353	SM	*02:01	*26:03	-	-	-	-	-	+	
7	9020	QBL	*26:01		-	-	-	-	-	-	
8	9025	DEU	*31:01		-	-	-	-	-	-	
9	9026	YAR	*26:01		-	-	-	-	-	-	
10	9107	LKT3	*24:02		-	-	-	-	-	-	
11	9051	PITOUT	*29:02		-	-	-	-	-	-	
12	9052	DBB	*02:01		-	-	-	-	-	-	
13	9004	JESTHOM	*02:01		-	-	-	-	-	-	
14	9071	OLGA	*31:01		-	-	-	-	-	-	
15	9075	DKB	*24:02		-	-	-	-	-	-	
16	9037	SWEIG007	*29:02		-	-	-	-	-	-	
17	9282	CTM3953540	*03:01	*80:01	-	-	-	-	-	+	
18	9257	32367	*33:03	*74:01	-	+	+	-	-	-	
19	9038	BM16	*02:01		-	-	-	-	-	-	
20	9059	SLE005	*02:01		-	-	-	-	-	-	
21	9064	AMALA	*02:17		-	-	-	-	-	-	
22	9056	KOSE	*02:01		-	-	-	-	-	-	
23	9124	IHL	*02:01	*34:01	-	-	-	-	-	-	
24	9035	JBUSH	*32:01		+	-	-	-	-	-	
25	9049	IBW9	*33:01		-	+	-	-	-	-	
26	9285	WT49	*02:05		-	-	-	-	-	-	
27	9191	CH1007	*24:10	*29:01	-	-	-	-	-	-	
28	9320	BEL5GB	*02:01	*29:02	-	-	-	-	-	-	
29	9050	MOU	*29:02		-	-	-	-	-	-	
30	9021	RSH	*30:01	*68:02	-	-	-	+	-	-	
31	9019	DUCAF	*30:02		-	-	-	-	-	-	
32	9297	HAG	*02:01		-	-	-	-	-	-	
33	9098	MT14B	*31:01		-	-	-	-	-	-	
34	9104	DHIF	*31:01		-	-	-	-	-	-	
35	9302	SSTO	*32:01		+	-	-	-	-	-	
36	9024	KT17	*02:06	*11:01	-	-	-	-	-	-	
37	9065	HHKB	*03:01		-	-	-	-	-	-	
38	9099	LZL	*02:17		-	-	-	-	-	-	
39	9315	CML	*01:01	*03:01	-	-	-	-	-	-	
40	9134	WHONP199	*02:07	*30:01	-	-	-	-	-	-	
41	9055	H0301	*03:01		-	-	-	-	-	-	
42	9066	TAB089	*02:07		-	-	-	-	-	-	
43	9076	T7526	*02:06	*02:07	-	-	-	-	-	-	
44	9057	TEM	*66:01		-	-	-	-	-	-	
45	9239	SHJO	*23:01	*24:02	-	-	-	-	-	-	
46	9013	SCHU	*03:01		-	-	-	-	-	-	
47	9045	TUBO	*02:16	*03:01	-	-	-	-	-	-	
48	9303	TER-ND	*02:01	*11:01	-	-	-	-	-	-	

February 2013
Rev. No.: 01u



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Rev. No.: 01u



CELL LINE VALIDATION SHEET																		
HLA-B low resolution SSP kit																		
					Well													
					51	52	53	54	55	56	57	58	59	60	61	62	63	64
				Prod. No.:	201078833	201073434	201073435	201078836	201073437	201078838	201073439	201073440	201073441	201073442	201073444	201073445	201073446	201073447
	IHWC cell line		B*															
1	9001	SA	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	+
2	9280	LK707	*52:01		*73:01	-	-	+	+	-	+	-	-	-	-	-	+	-
3	9011	E4181324	*52:01			-	-	+	+	-	+	-	-	-	-	+	+	+
4	9275	GU373	*15:10		*53:01	-	-	-	+	-	-	-	-	-	+	-	+	+
5	9009	KAS011	*37:01			-	-	-	-	-	+	-	-	-	-	-	+	-
6	9353	SM	*39:01		*51:01	-	-	+	+	-	-	-	-	-	-	+	+	+
7	9020	QBL	*18:01			-	-	-	-	-	-	-	-	-	+	-	-	+
8	9025	DEU	*35:01			-	-	-	-	-	-	-	-	-	+	-	-	+
9	9026	YAR	*38:01			-	-	-	-	-	-	-	-	-	-	-	+	-
10	9107	LKT3	*54:01			-	-	-	-	-	-	+	+	-	-	-	-	+
11	9051	PITOUT	*44:03			-	-	-	-	-	+	-	-	-	-	-	+	-
12	9052	DBB	*57:01			-	-	-	+	-	-	-	-	-	+	-	+	-
13	9004	JESTHOM	*27:05			-	-	-	-	-	+	-	-	-	-	-	+	-
14	9071	OLGA	*15:01		*15:20	-	-	-	-	-	+	-	-	-	-	+	-	+
15	9075	DKB	*40:01			-	-	-	-	+	+	-	-	-	-	-	-	+
16	9037	SWEIG007	*40:02			-	-	-	-	+	+	-	-	-	-	-	-	+
17	9282	CTM3953540	*08:01		*55:01	-	-	+	-	-	-	-	+	-	-	-	-	+
18	9257	32367	*14:01		*56:01	-	-	-	-	-	-	-	+	-	-	-	-	+
19	9038	BMI6	*18:01			-	-	-	-	-	-	-	-	-	+	-	-	+
20	9059	SLE005	*40:01			-	-	-	-	+	+	-	-	-	-	-	-	+
21	9064	AMALA	*15:01			-	-	-	-	-	+	-	-	-	-	+	-	+
22	9056	KOSE	*35:03			-	-	-	-	-	-	-	-	-	+	-	-	+
23	9124	IHL	*40:02		*56:02	-	-	-	-	+	+	-	+	-	-	-	-	+
24	9035	JBUSH	*38:01			-	-	-	-	-	-	-	-	-	-	-	+	-
25	9049	IBW9	*14:02			-	-	-	-	-	-	-	-	-	-	-	-	+
26	9285	WT49	*58:01			-	-	-	+	-	-	-	-	-	-	-	+	-
27	9191	CH1007	*07:05		*51:01	-	-	+	+	-	-	-	-	-	+	-	+	+
28	9320	BEL5GB	*44:02		*44:03	-	-	-	-	-	+	+	-	-	-	-	+	-
29	9050	MOU	*44:03			-	-	-	-	-	+	-	-	-	-	-	+	-
30	9021	RSH	*42:01			-	-	-	-	-	-	-	-	-	-	-	-	+
31	9019	DUCAF	*18:01			-	-	-	-	-	-	-	-	-	+	-	-	+
32	9297	HAG	*41:02			-	-	-	-	+	+	-	-	-	-	-	-	+
33	9098	MT14B	*40:01			-	-	-	-	+	+	-	-	-	-	-	-	+
34	9104	DHIF	*38:01			-	-	-	-	-	-	-	-	-	-	-	+	-
35	9302	SSTO	*44:02			-	-	-	-	-	+	+	-	-	-	-	+	-
36	9024	KT17	*15:01		*35:01	-	-	-	-	-	+	-	-	-	+	+	-	+
37	9065	HHKB	*07:02			-	-	-	-	-	-	-	-	-	-	-	-	+
38	9099	LZL	*15:01			-	-	-	-	-	+	-	-	-	-	+	-	+
39	9315	CML	*08:01		*27:05	-	-	-	-	-	+	-	-	-	-	-	+	+
40	9134	WHONP199	*13:02		*46:01	-	-	-	-	-	+	-	-	-	-	+	+	+
41	9055	H0301	*14:02			-	-	-	-	-	-	-	-	-	-	-	-	+
42	9066	TAB089	*46:01			-	-	-	-	-	-	-	-	-	-	+	-	+
43	9076	T7526	*46:01			-	-	-	-	-	-	-	-	-	-	+	-	+
44	9057	TEM	*38:01			-	-	-	-	-	-	-	-	-	-	-	+	-
45	9239	SHJO	*42:01		*50:01	-	-	+	-	+	+	-	+	-	-	-	-	+
46	9013	SCHU	*07:02			-	-	-	-	-	-	-	-	-	-	-	-	+
47	9045	TUBO	*51:01			-	-	+	+	-	-	-	-	-	+	-	+	-
48	9303	TER-ND	*35:01		*44:03	-	-	-	-	-	+	-	-	-	+	-	+	+

Lot No.: **65K**

Lot-specific Information

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CELL LINE VALIDATION SHEET																				
DR low resolution primer set																				
					Well															
					65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
				Prod. No.:	201078901	201068902	201068903	201078904	201068905	201068906	201068907	201068908	201068909	201068910	201068911	201068912	201068913	201068914	201078915	201078916
	IHCW cell line		DRB1																	
1	9001	SA	*01:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*15:02	*04:05	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
3	9011	E4181324	*15:02		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*16:01		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*04:07	*08:03	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-
7	9020	QBL	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*04:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
9	9026	YAR	*04:02		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
10	9107	LKT3	*04:05		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
11	9051	PITOUT	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
12	9052	DBB	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
13	9004	JESTHOM	*01:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*08:02		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+
15	9075	DKB	*09:01		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
16	9037	SWEIG007	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
17	9282	CTM3953540	*03:01	*13:01	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+
18	9257	32367	*09:01	*11:01	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+
19	9038	BM16	*12:01		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
20	9059	SLE005	*13:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
21	9064	AMALA	*14:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*13:02	*14:01	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
23	9124	IHL	*08:03	*14:14	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
24	9035	JBUSH	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
25	9049	IBW9	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
26	9285	WT49	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*04:05	*10:01	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
28	9320	BEL5GB	*04:16	*07:01	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
29	9050	MOU	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
30	9021	RSH	*03:02		-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
31	9019	DUCAF	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*13:03		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-
33	9098	MT14B	*04:04		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
34	9104	DHIF	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
35	9302	SSTO	*04:03		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
36	9024	KT17	*04:03	*04:06	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
37	9065	HHKB	*13:01		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
38	9099	LZL	*14:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
39	9315	CML	*03:01	*04:01	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
40	9134	WHONP199	*07:01	*09:01	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
41	9055	H0301	*13:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
42	9066	TAB089	*08:03		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
43	9076	T7526	*09:01		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
44	9057	TEM	*14:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
46	9013	SCHU	*15:01		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*11:04	*12:01	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
48	9303	TER-ND	*01:03		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Lot No.: **65K**

Lot-specific Information

www.olerup-ssp.com

CELL LINE VALIDATION SHEET													
DR low resolution primer set													
					Prod. No.:	Well							
						81	82	83	84	85	86	87	
						201078917	201068918	201068919	201068920	201078921	201068922	201068923	
	IHCW cell line		DRB1										
1	9001	SA	*01:01			-	-	-	-	-	-	-	
2	9280	LK707	*15:02	*04:05		-	-	-	-	-	+	+	
3	9011	E4181324	*15:02			-	-	-	-	-	-	+	
4	9275	GU373	*03:01			+	-	-	-	+	-	-	
5	9009	KAS011	*16:01			-	-	-	-	-	-	+	
6	9353	SM	*04:07	*08:03		-	-	-	-	-	+	-	
7	9020	QBL	*03:01			+	-	-	-	+	-	-	
8	9025	DEU	*04:01			-	-	-	-	-	+	-	
9	9026	YAR	*04:02			-	-	-	-	-	+	-	
10	9107	LKT3	*04:05			-	-	-	-	-	+	-	
11	9051	PITOUT	*07:01			-	-	-	-	-	+	-	
12	9052	DBB	*07:01			-	-	-	-	-	+	-	
13	9004	JESTHOM	*01:01			-	-	-	-	-	-	-	
14	9071	OLGA	*08:02			-	-	-	-	-	-	-	
15	9075	DKB	*09:01			-	-	+	-	-	+	-	
16	9037	SWEIG007	*11:01			-	-	-	-	+	-	-	
17	9282	CTM3953540	*03:01	*13:01		+	-	-	-	+	-	-	
18	9257	32367	*09:01	*11:01		-	-	+	-	+	+	-	
19	9038	BM16	*12:01			-	-	-	-	+	-	-	
20	9059	SLE005	*13:02			+	-	-	-	+	-	-	
21	9064	AMALA	*14:02			+	-	+	-	+	-	-	
22	9056	KOSE	*13:02	*14:01		+	+	+	+	+	-	-	
23	9124	IHL	*08:03	*14:14		+	-	+	+	+	-	-	
24	9035	JBUSH	*11:01			-	-	-	-	+	-	-	
25	9049	IBW9	*07:01			-	-	-	-	-	+	-	
26	9285	WT49	*03:01			+	-	-	-	+	-	-	
27	9191	CH1007	*04:05	*10:01		-	-	-	-	-	+	-	
28	9320	BEL5GB	*04:16	*07:01		-	-	-	-	-	+	-	
29	9050	MOU	*07:01			-	-	-	-	-	+	-	
30	9021	RSH	*03:02			+	-	-	-	+	-	-	
31	9019	DUCAF	*03:01			+	-	-	-	+	-	-	
32	9297	HAG	*13:03			+	-	-	-	+	-	-	
33	9098	MT14B	*04:04			-	-	-	-	-	+	-	
34	9104	DHIF	*11:01			-	-	-	-	+	-	-	
35	9302	SSTO	*04:03			-	-	-	-	-	+	-	
36	9024	KT17	*04:03	*04:06		-	-	-	-	-	+	-	
37	9065	HHKB	*13:01			+	-	-	-	+	-	-	
38	9099	LZL	*14:02			+	-	+	-	+	-	-	
39	9315	CML	*03:01	*04:01		+	-	-	-	+	+	-	
40	9134	WHONP199	*07:01	*09:01		-	-	+	-	-	+	-	
41	9055	H0301	*13:02			+	-	-	-	+	-	-	
42	9066	TAB089	*08:03			-	-	-	-	-	-	-	
43	9076	T7526	*09:01			-	-	+	-	-	+	-	
44	9057	TEM	*14:01			-	+	+	+	+	-	-	
45	9239	SHJO	*07:01			-	-	-	-	+	-	-	
46	9013	SCHU	*15:01			-	-	-	-	-	-	+	
47	9045	TUBO	*11:04	*12:01		-	-	-	-	+	-	-	
48	9303	TER-ND	*01:03			-	-	-	-	-	-	-	

Lot No.: **65K**

Lot-specific Information

www.olerup-ssp.com

CELL LINE VALIDATION SHEET														
DQ low resolution primer set														
					Well									
						88	89	90	91	92	93	94	95	
				Production No.		200966601	200966602	200966603	200966604	200966605	200966606	200966607	201074508	
	IHWC cell line		DQB1											
1	9001	SA	*05:01		+	-	-	-	-	-	-	-	-	
2	9280	LK707	*06:01	*02:02	-	+	+	-	-	-	-	-	-	
3	9011	E4181324	*06:01		-	+	-	-	-	-	-	-	-	
4	9275	GU373	*02:01		-	-	+	-	-	-	-	-	-	
5	9009	KAS011	*05:02		+	-	-	-	-	-	-	-	-	
6	9353	SM	*03:02	*06:01	-	+	-	-	+	-	-	+	-	
7	9020	QBL	*02:01		-	-	+	-	-	-	-	-	-	
8	9025	DEU	*03:01		-	-	-	+	-	-	-	+	-	
9	9026	YAR	*03:02		-	-	-	-	+	-	-	+	-	
10	9107	LKT3	*04:01		-	-	-	-	-	-	-	-	+	
11	9051	PITOUT	*02:02		-	-	+	-	-	-	-	-	-	
12	9052	DBB	*03:03		-	-	-	-	-	-	+	+	-	
13	9004	JESTHOM	*05:01		+	-	-	-	-	-	-	-	-	
14	9071	OLGA	*04:02		-	-	-	-	-	-	-	-	+	
15	9075	DKB	*03:03		-	-	-	-	-	-	+	+	-	
16	9037	SWEIG007	*03:01		-	-	-	+	-	-	-	+	-	
17	9282	CTM 3953540	*02:01	*06:03	-	+	+	-	-	-	-	-	-	
18	9257	32367	*06:02	*02:02	-	+	+	-	-	-	-	-	-	
19	9038	BM16	*03:01		-	-	-	+	-	-	-	+	-	
20	9059	SLE005	*06:04		-	+	-	-	-	-	-	-	-	
21	9064	AMALA	*03:01		-	-	-	+	-	-	-	+	-	
22	9056	KOSE	*05:03	*06:04	+	+	-	-	-	-	-	-	-	
23	9124	IHL	*05:03	*06:01	+	+	-	-	-	-	-	-	-	
24	9035	JBUSH	*03:01		-	-	-	+	-	-	-	+	-	
25	9049	IBW9	*02:02		-	-	+	-	-	-	-	-	-	
26	9285	WT49	*02:01		-	-	+	-	-	-	-	-	-	
27	9191	CH1007	*04:01	*05:01	+	-	-	-	-	-	-	-	+	
28	9320	BEL5GB	*02:02	*03:01	-	-	+	+	-	-	-	+	-	
29	9050	MOU	*02:02		-	-	+	-	-	-	-	-	-	
30	9021	RSH	*04:02		-	-	-	-	-	-	-	-	+	
31	9019	DUCAF	*02:01		-	-	+	-	-	-	-	-	-	
32	9297	HAG	*03:01		-	-	-	+	-	-	-	+	-	
33	9098	MT14B	*03:02		-	-	-	-	+	-	-	+	-	
34	9104	DHIF	*03:01		-	-	-	+	-	-	-	+	-	
35	9302	SSTO	*03:05		-	-	-	-	+	-	-	+	-	
36	9024	KT17	*03:02		-	-	-	-	+	-	-	+	-	
37	9065	HHKB	*06:03		-	+	-	-	-	-	-	-	-	
38	9099	LZL	*03:01		-	-	-	+	-	-	-	+	-	
39	9315	CML	*02:01	*03:01	-	-	+	+	-	-	-	+	-	
40	9134	WHONP199	*02:02	*03:03	-	-	+	-	-	+	+	+	-	
41	9055	H0301	*06:09		-	+	-	-	-	-	-	-	-	
42	9066	TAB089	*06:01		-	+	-	-	-	-	-	-	-	
43	9076	T7526	*03:03		-	-	-	-	-	-	+	+	-	
44	9057	TEM	*05:03		+	-	-	-	-	-	-	-	-	
45	9239	SHJO	*02:02		-	-	+	-	-	-	-	-	-	
46	9013	SCHU	*06:02		-	+	-	-	-	-	-	-	-	
47	9045	TUBO	*03:01		-	-	-	+	+	-	-	+	-	
48	9303	TER-ND	*05:01		+	-	-	-	-	-	-	-	-	

CERTIFICATE OF ANALYSIS

Olerup SSP® HLA-A-B-DR-DQ SSP Combi Tray

Product number: 101.708-24u – without *Taq* pol.

Lot number: 65K

Expiry date: 2013-June-01

Number of tests: 24 tests

Number of wells per test: 95 + 1

Well specifications:

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
1	2010-787-01	9	2010-787-10	17	2010-733-18
2	2010-787-02	10	2010-787-11	18	2010-733-19
3	2010-733-03	11	2010-733-12	19	2010-787-20
4	2010-733-04	12	2010-733-13	20	2010-733-21
5	2010-787-06	13	2010-787-14	21	2010-787-23
6	2010-733-07	14	2010-733-15		
7	2010-733-08	15	2010-787-16		
8	2010-733-09	16	2010-787-17		

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

Additional 5'- and/or 3'-primers in primer solutions 1, 3 to 7, 9, 11 and 13 to 21 were tested by separately adding one 3'-primer, respectively one 5'-primer. One primer in primer solutions 2, 3, 9, 10, 14, 17 and 18 was not possible to test.

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
22	2009-633-48	38	2010-734-18	54	2010-788-36
23	2010-734-02	39	2010-788-19	55	2010-734-37
24	2010-788-03	40	2010-788-20	56	2010-788-38
25	2010-734-04	41	2010-734-21	57	2010-734-39
26	2010-788-05	42	2010-734-22	58	2010-734-40
27	2010-734-06	43	2010-734-23	59	2010-734-41
28	2010-734-07	44	2010-788-24	60	2010-734-42
29	2010-734-08	45	2010-788-25	61	2010-734-44
30	2010-734-09	46	2010-734-27	62	2010-734-45
31	2010-734-10	47	2010-734-28	63	2010-734-46
32	2010-734-11	48	2010-734-29	64	2010-734-47
33	2010-734-13	49	2010-734-31		
34	2010-734-14	50	2010-734-32		
35	2010-788-15	51	2010-788-33		
36	2010-734-16	52	2010-734-34		
37	2010-734-17	53	2010-734-35		

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

Additional 5'-primers and/or 3'-primers in primer solutions 22, 24, 27, 33-35, 39, 41, 45, 46, 48, 49, 53 and 58 were tested by separately adding one additional 3'-primer, respectively one additional 5'-primer. One or two primers in primer solutions 49, 56 and 60 were not possible to test.

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
65	2010-789-01	73	2010-689-09	81	2010-789-17
66	2010-689-02	74	2010-689-10	82	2010-689-18
67	2010-689-03	75	2010-689-11	83	2010-689-19
68	2010-789-04	76	2010-689-12	84	2010-689-20
69	2010-689-05	77	2010-689-13	85	2010-789-21
70	2010-689-06	78	2010-689-14	86	2010-689-22
71	2010-689-07	79	2010-789-15	87	2010-689-23
72	2010-689-08	80	2010-789-16		

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

Additional 5'-primers and/or 3'-primers in primer solutions 65, 67, 68, 70, 73 to 76, 79, 80, 82 and 84 were tested by separately adding one additional 3'-primer, respectively one additional 5'-primer.

One, two or three of the primers in primer solutions 65, 67, 68, 72 to 74, 77, 79, 80 and 86 were not possible to test.

Well No.	Production No.
88	2009-666-01
89	2009-666-02
90	2009-666-03
91	2009-666-04
92	2009-666-05
93	2009-666-06
94	2009-666-07
95	2010-745-08

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

One additional 5'-primer in primer solutions 89 and 91 were tested by separately adding one additional 3'-primer.

The negative control primer pairs, **Production No. 2010-760-01**, can detect contamination with PCR products diluted 10^{-7} .

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

Date of approval: 2010-December-15

Approved by

Production Quality Control

Lot No.: **65K**

Lot-specific Information

www.olerup-ssp.com

Declaration of Conformity

Product name: *Olerup* SSP® HLA-A-B-DR-DQ SSP Combi Tray
Product number: 101.708-24u
Lot number: 65K

Intended use: HLA-A, HLA-B, HLA-DR and HLA-DQ low resolution histo-
compatibility testing

Manufacturer: *Olerup* SSP AB
Franzengatan 5
SE-112 51 Stockholm, 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, Franzengatan 5, SE-112 51 Stockholm, Sweden.

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

Stockholm, Sweden
2013-February-11

Ann-Cathrin Jareman
Head of QA and Regulatory Affairs

Lot No.: **65K**

Lot-specific Information

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Lot No.: **65K**

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Lot-specific Information

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