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

Product number:	**101.708-24 – including *Taq* pol.**
Lot number:	**24M**
Expiry date:	**2013-December-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. 24M.

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. 65K)**.
The primers of the wells detailed below have been exchanged, modified or added compared to the previous lot.

Well	5'-primer	3'-primer	rationale
12	Added	-	Primer added for improved yield of HLA-specific PCR product.

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. 65K)**.
The primers of the wells detailed below have been exchanged, modified or added compared to the previous lot.

Well	5'-primer	3'-primer	rationale
26	Added	-	Increased yield of specific PCR product.

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. 65K)**.
The primers of the wells detailed below have been exchanged, added or modified compared to the previous lot.

Well	5'-primer	3'-primer	rationale
67	-	Added	Primer added for the DRB1*15:50N allele.
75	-	Modified	Improved specificity of amplification.

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. 65K)**.
The primers of the wells detailed below have been exchanged, added or modified compared to the previous lot.

Well	5'-primer	3'-primer	rationale
92	Modified	-	Improved specificity of specific primer pair.

Change in revision R01 compared to R00:
1. Primer mix 2 may give a lower yield of HLA-specific PCR product than the other HLA-A low primer mixes.

Change in revision R02 compared to R01:
1. Primer mix 39 does not amplify the B*15:101 allele. This has been corrected in the Specificity and Interpretation tables.

Change in revision R03 compared to R02:
1. Primer mix 16 does not amplify the HLA-A*36:02 allele. This has been corrected in the Specificity and Interpretation Tables.

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'-primer[1]	**164**	**340**	**440**	**45**	**45**	**43**
	5'-CAC3'	**5'-Agg3'**	**5'-TTA3'**	**5'-Tgg3'**	**5'-Tgg3'**	**5'-Tgg3'**
3'-primer[2]	**231**	**2nd I**	**507**	**59**	**58**	**57**
	5'-TgC3'	**5'-AAA3'**	**5'-TTg3'**	**5'-CTC3'**	**5'-ggC3'**	**5'-CTC3'**
A*	**+**	**+**	**+**			
B*	**+**	**+**	**+**			
C*	**+**	**+**	**+**			
DRB1				**+**	**+**	
DRB3				**+**	**+**	
DRB5				**+**		
DQB1					**+**	
DPB1						**+**

[1]The 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 codonnumbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.
[2]The 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. '24M'.
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 mixes 37 and 58, 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 amplified by primer mix 58, the C*03:12 and C*03:19 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 2010[1] 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 specificities[2].

All the HLA-B alleles, **i.e. B*07:02 to B*83:01**, recognized by the HLA Nomenclature Committee in October 2010[1] 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 specificities[3].

All the HLA-DRB1, -DRB3, -DRB4[4] 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 2010[1] 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 specificities[5].

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**, recognized by the HLA Nomenclature Committee in October 2010[1] 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]

[1]HLA-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.
[2]The 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.
[3]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.
[4]The DRB4*02:01N and DRB4*03:01N null alleles will not be amplified by the DR low resolution primer set.
[5]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.
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.
[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, 01:06-01:33, 01:01:38L, 01:35-01:81, 03:18, 36:01-36:05
2[6,7]	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, 02:24:01-02:35:01, 02:35:03-02:47, 02:49-02:77, 02:78[w], 02:79:01-02:97:02, 02:99, 02:101:01-02:128, 02:130-02:282
3[8]	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, 34:02:01-34:04, 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-01:33, 01:01:38L, 01:35-01:78, 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[9]	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, 68:01:01:01-68:66, 69:01
8[5]	75 bp	**800 bp**	A25, A32	*25:01:01-25:13, 32:01:01-32:02, 32:04, 32:06-32:30
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
12[7]	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
13[5]	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[5,6,7]	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, 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[7]	160, 200 bp	**800 bp**	A74	*29:19, 74:01-74:14N
19[9]	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, 68:01:01:01-68:66
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[5,7,9]	70, 160, 240, 495 bp	**800 bp**	A2, A26, A68, A80	*02:55, 03:41, 03:63, 03:75, 03:88, 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

[1]Alleles 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 inherit 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.

[2]The 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.
[3]The 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.
[4]For 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.
[5]Specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.
[6]The primer pairs in vials 1, 2, 10 and 14 will in many samples give rise to two or three HLA-specific PCR fragments.
[7]Primer mixes 2, 9, 10, 12, 14, 18 and 21 may yield less specific PCR product than the other primer mixes.
[8]Primer mix 3 may faintly amplify the A*30:04, 30:06, 30:17 and 30:29 alleles.
[9]Primer mix 5, 19 and 21 may give rise to primer oligomer formation.
[10]The 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.
[11]Primer 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]
22[10]	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
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53[6]	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,	*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-

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57[8,9,12]	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, 49, 50, 51, 54, 56	*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, 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-

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62[6]	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[15]	360 bp	1070 bp	Bw4	
64	350 bp	1070 bp	Bw6	

[1]Alleles 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 inherit 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.
[2]The 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.
[3]The 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.
[4]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 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.
[5]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 mixes 37 and 58, 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 amplified by primer mix 58, the C*03:12 and C*03:19 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.
[6]Specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.
[7]Primer 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.
[8]Primer mixes 25, 26, 30, 38, 41, 42, 57 and 61 may yield less specific PCR product than the other HLA-B low resolution primer mixes.
[9]Primer mixes 30, 31, 40 and 57 may give rise to nonspecific amplifications, most pronounced in primer mix 30.
[10]Primer mixes 22, 39, 40, 42 and 60 may give rise to a primer oligomer artifact.
[11]The B*57 and B*58 alleles might be faintly amplified by primer mix 30.
[12]Primer mix 57 may yield less specific PCR product than the other HLA-B low resolution primer mixes in B*54 alleles.
[13]The C*17:01 to C*17:04 alleles might be faintly amplified by primer mix 45.
[14]Primer mix 50 might generate a false band of about 500 base pairs. This band should be disregarded when interpreting HLA-B low resolution typings.
[15]The 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[5,6,9]	120, 220 bp	430 bp	3, 17, 18, 11	*03:01:01:01-03:58, 11:07, 11:53, 15:25
70[5,6,9]	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
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]	85, 135, 180 bp	430 bp	3, 9, 11	*03:08, 09:01:02-09:09, 11:07, 11:53
76[7]	205 bp	430 bp	10	*10:01:01-10:03

77[5]	100, 170 bp	430 bp	11, 3, 8	*03:08, 08:31, 08:41, 11:01:01-11:70, 11:72-11:98
78[5]	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
80[6]	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, 14:15-14:16, 14:22, 14:24-14:25, 14:27, 14:37, 14:53, 14:73
81[9]	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
82[5,6]	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[5,6,8]	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
84[5, 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]
85[9]	160, 240 bp	430 bp	52	**DRB3*01:01:02:01-01:14, DRB3*02:01-02:25, DRB3*03:01:01-03:03**
86[10]	215 bp	430 bp	53	**DRB4*01:01:01:01-01:08**
87	175 bp	430 bp	51	**DRB5*01:01:01-01:14, DRB5*02:02-02:05**

[1]Alleles 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 inherit 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.
[2]The 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.
[3]The 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.
[4]For 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.
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.
[5]Specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.
[6]Individual alleles can give to rise to two differently sized specific PCR fragments in primer mixes 65 and 69 to 72.
[7]Primer mixes 65, 76 and 84 may give rise to primer oligomer formation.
[8]Primer 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.
[9]Due 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.
[10]The 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
89	220, 270 bp	430 bp	1, 5, 6	*06:01:01-06:40
90	210 bp	430 bp	2	*02:01:01-02:05
91	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
92[6]	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]	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[6,7]	145, 185 bp	**515 bp**	3, 7, 8, 9	*03:01:01-03:31
95[6]	210, 245 bp	430 bp	4	*04:01:01-04:06
96[8]				**Negative control**

[1]Alleles 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 inherit 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.
[2]The 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.
In the presence of a specific amplification the intensity of the control band often decreases.

[3]The 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.
[4]For 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.
[5]Primer mixes 93 may give rise to primer dimer formation
[6]Primer mixes 92, 93, 94 and 95 may yield somewhat less intense specific PCR fragments than the other DQ low resolution primer mixes.
[7]Primer mix 94 may have tendencies of unspecific amplifications.
[8]Primer 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.	120	210	205	190	135	175	165	75	85	80	185	175	100	90	240	140	200	160	220	240	70
PCR product(s)	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			2nd I		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

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

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

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

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																		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

[1]The 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 21contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.
[2]The 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.
[3]The 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.
[4]The 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*02:22:01.
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*33:03:01.
[5]The 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.
[6]The primer pairs in vial 2 will in many samples give rise to two specific PCR fragments.
[7]The 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.
[8]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.
[9]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.
'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

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.
		425				195	270	410	175	430	210				330	210		240		150			PCR product(s)
						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	Length of int. pos. control[1]
246	44	44	355	540	1st I	355	209	41	209	48	357	49	206	1st I	15	141	420	209	206	165	1st I	1st 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' -TgC 3'				5' -CgT 3'					
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.

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

42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	ser.[11]	Well No. 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.

Lot No.: 24M **Lot-specific Information**

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

Lot No.: 24M **Lot-specific Information**

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
																					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.

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

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
	43	44																				64	B39, B16, Null, –	*14:08, 39:25N, 39:30, 39:32-39:34, 39:43, 39:47, 39:50[6]
	43	44					49															64	–	*14:10
														56						62		64	B62, Null, –	*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
														56						62		64	B62	*15:01:02
														56						62		64	B62	*15:01:04
														56								64	B62, –	*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
																				62		64	B62, Null, –	*15:01:19, 15:28, 15:120, 15:149N
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						48						54						60			63		B57, –	*57:07, 57:24
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		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]

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**

[1]The 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 2 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 to 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.
[2]The 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.
[3]The 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.
[4]The sequence of the B*0701 allele has been shown to be in error.
The B*08:06 allele has been shown to be identical to B*08:20.
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*39:01:01:01.
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*44:02:01:01.
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*15:18:01.
The B*9530 allele has been renamed B*15:27:02.

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.

[5]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.
[6]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.
[7]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.
[8]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.
[9]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.
[10]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.
[11]The 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.

General **"Instructions for Use"**
IFU-01 can be downloaded from
www.olerup-ssp.com

Lot No.: 24M **Lot-specific Information**

INTERPRETATION TABLE

DR low resolution SSP typing

Amplification patterns of the DRB1*01:01 to DRB1*10:03 alleles

	Well																						
	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
Length of spec.	200	200	215	210	120	80	85	100	210	170	85	205	100	85	215	195	175	100	110	110	160	215	175
PCR product(s)	255				220	210	210	175	230	215	135		170	105		215		140	135	175	240		
										250	130							155	170	225			
Length of int. pos. control[1]	515	430	430	430	430	430	430	430	430	515	430	430	430	430	430	430	430	430	430	430	430	430	430
5'-primer(s)[2]	13 (124)	14 (129)	13 (126)	13 (126)	13 (125)	13 (125)	13 (125)	13 (125)	14 (127)	16 (133)	26 (165)	31 (178)	13 (125)	16 (133)	10 (116)	10 (116)	13 (125)	1st I	26 (164)	13 (125)	10 (116)	28 (170)	13 (125)
	5'-A,T-3'	5'-gAA-3'	5'-Agg-3'	5'-Agg-3'	5'-gTC-3'	5'-gTC-3'	5'-gTC-3'	5'-ACA-3'	5'-ATA-3'	5'-gTT-3'	5'-TAT-3'	5'-gCg-3'	5'-gTC-3'	5'-gTT-3'	5'-gCT-3'	5'-gCT-3'	5'-gTC-3'	5'-CAA-3'	5'-gTA-3'	5'-gTC-3'	5'-gCT-3'	5'-gAT-3'	5'-gTA-3'
	14 (129)		13 (126)	13 (126)	47 (227)	16 (133)		13 (125)	14 (127)	16 (133)	58 (261)		16 (133)		12 (122)	12 (122)		37 (197)	34 (189)	34 (189)	10 (116)		
	5'-gAA-3'		5'-AAg-3'	5'-AAg-3'	5'-gTT-3'	5'-gTT-3'		5'-ACC-3'	5'-ATA-3'	5'-gTT-3'	5'-gAg-3'		5'-gTC-3'		5'-TAT-3'	5'-TAT-3'		5'-gTT-3'	5'-CAg-3'	5'-CAg-3'	5'-gCT-3'		
								13 (125)	16 (133)				38 (200)		13 (125)	13 (125)		37 (197)			38 (199)		
								5'-ATA-3'	5'-gTT-3'				5'-CgT-3'		5'-gTC-3'	5'-gTC-3'		5'-gTA-3'			5'-TCC-3'		
								13 (125)								16 (133)							
								5'-gTC-3'								5'-gTT-3'							
																16 (133)							
																5'-gTC-3'							
3'-primer(s)[3]	67 (286)	67 (286)	67 (286)	67 (286)	73 (305)	26 (164)	28 (171)	33 (184)	71 (298)	58 (260)	57 (257)	86 (344)	58 (260)	30 (175)	70 (295)	67 (286)	58 (260)	42 (213)	57 (257)	57 (257)	51 (239)	87 (346)	57 (258)
	5'-gAg-3'	5'-gAT-3'	5'-gAT-3'	5'-gAA-3'	5'-ggC-3'	5'-ggT-3'	5'-CTC-3'	5'-gTg-3'	5'-CTC-3'	5'-CCT-3'	5'-CgA-3'	5'-CAC-3'	5'-CCT-3'	5'-gTg-3'	5'-gTC-3'	5'-gAA-3'	5'-Cgg-3'	5'-TCA-3'	5'-CAg-3'	5'-CAg-3'	5'-CCC-3'	5'-CTC-3'	5'-gCg-3'
	67 (286)		70 (295)	67 (286)	73 (305)	71 (299)	70 (295)	58 (260)	73 (305)	74 (307)	73 (305)	86 (344)	58 (260)	38 (199)	71 (299)	71 (298)	58 (260)	57 (257)	70 (295)	60 (265)	77 (317)	87 (346)	58 (260)
	5'-gAg-3'		5'-CTg-3'	5'-gAg-3'	5'-ggC-3'	5'-gCT-3'	5'-CTg-3'	5'-Cgg-3'	5'-ggC-3'	5'-CAg-3'	5'-ggC-3'	5'-CCA-3'	5'-CCT-3'	5'-CAg-3'	5'-gCT-3'	5'-CgC-3'	5'-CAg-3'	5'-CAg-3'	5'-CTg-3'	5'-gTg-3'	5'-AAT-3'	5'-CTT-3'	5'-CCT-3'
	67 (286)		71 (298)	70 (297)	74 (308)				77 (317)	86 (344)	78 (319)		58 (260)			71 (298)		71 (298)	70 (296)	70 (296)			
	5'-gAT-3'		5'-CgC-3'	5'-CTg-3'	5'-CCC-3'				5'-AAT-3'	5'-CAC-3'	5'-CAC-3'		5'-CCT-3'			5'-CTC-3'		5'-CgC-3'	5'-TCC-3'	5'-TCC-3'			
	71 (299)		71 (299)	72 (301)					78 (319)											74 (307)			
	5'-gCg-3'		5'-gCT-3'	5'-ggC-3'					5'-CAC-3'											5'-CAg-3'			
	86 (344)		73 (305)																				
	5'-CCA-3'		5'-ggC-3'																				
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

CE 0088

For In Vitro Diagnostic Use.

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					
*07:01:01:01-07:01:03, 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

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

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

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

Lot No.: 24M **Lot-specific Information**

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

[1]The 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.
[2]The 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.
[3]The 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.
[4]The DRB1*0702 allele has been shown to be identical to DRB1*07:01:01:01. The DRB1*08031 allele has been shown to be identical to DRB1*08:03:02. The DRB1*09011 allele has been shown to be identical to DRB1*09:01:02. The DRB1*1171 allele has been shown to be identical to DRB1*11:02:01. The DRB1*12031 allele has been shown to be identical to DRB1*12:01:01. The sequence of the DRB1*1466 allele has been shown to be identical to DRB1*14:23:02. The DRB1*1606 allele has been shown to be identical to DRB1*16:05:01. 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 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.
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.
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.
[5]The 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

		Well[6]								
		88	89	90	91	92	93	94	95	96
Length of spec.		225	220	210	220	130	135	145	210	Negative control
PCR product(s)			270					185	245	
Length of int.		515	430	430	515	515	515	515	430	
pos. control[1]										
5'-primer(s)[2]		26(173)	9(122)	30(185)	26(173)	28(179)	26(173)	38(210)	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)	
		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 allele[4]	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 allele[4]	ser.[5]									
Well No.		88	89	90	91	92	93	94	95	96

[1]The 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.
[2]The 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.
[3]The 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.
[4]The sequence of the DQB1*030301 allele has been shown to be identical to DQB1*03:03:02.
[5]The 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.
[6]Primer 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	11	12	13	14	15
				Lot No.:	201078701	201078702	201073303	201073304	201078706	201073307	201073308	201073309	201078710	201078711	201187512	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	SSTO	*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.: 24M **Lot-specific Information**

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
	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		-	-	-	-	-	-
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	-	-	-	-	-	-

CELL LINE VALIDATION SHEET

HLA-B low resolution SSP kit

					Well														
					22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
				Prod. No.:	200963348	201073402	201078803	201073404	201185805	201073406	201073407	201073408	201073409	201073410	201073411	201073413	201073414	201078815	201073416
	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	BM16	*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	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET

HLA-B low resolution SSP kit

					Well													
					37	38	39	40	41	42	43	44	45	46	47	48	49	50
				Prod. No.:	201073417	201073418	201078819	201182320	201073421	201073422	201073423	201078824	201078825	201073427	201073428	201185829	201182331	201073432
	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	BM16	*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	+	+	-	-	-	-	-	-	-	-	-	+	-	-

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.:	201182333	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	BM16	*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	-	-	-	-	-	+	-	-	-	-	+	-	+	+

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.:	201185101	201185102	201185103	201185104	201185105	201185106	201185107	201185108	201185109	201185110	201185111	201185112	201185113	201185114	201185115	201185116
	IHWC 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		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET

DR low resolution primer set

					Well[1]						
					81	82	83	84	85	86	87
				Prod. No.:	201185117	201185118	201185119	201185120	201185121	201185122	201185123
	IHWC 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		-	-	-	-	-	-	-

[1]The DRB4*01:03:01:02N allele is amplified by primer mix 82 in the DBB/9052 cell line.

CELL LINE VALIDATION SHEET

DQ low resolution primer set

					Well							
					88	89	90	91	92	93	94	95
				Production No.	201185201	201185202	201185203	201185204	201185205	201185206	201185207	201185208
	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: **101.708-24 – including *Taq* pol.**
Lot number: **24M**
Expiry date: **2013-December-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	2011-875-12	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 or more 3'-primers, respectively 5'-primers. 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	2011-823-20	56	2010-788-38
25	2010-734-04	41	2010-734-21	57	2010-734-39
26	2011-858-05	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	2011-858-29	64	2010-734-47
33	2010-734-13	49	2011-823-31		
34	2010-734-14	50	2010-734-32		
35	2010-788-15	51	2011-823-33		
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, 48, 49, 53 and 58 were tested by separately adding additional 3'-primers, respectively additional 5'-primers. 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	2011-851-01	73	2011-851-09	81	2011-851-17
66	2011-851-02	74	2011-851-10	82	2011-851-18
67	2011-851-03	75	2011-851-11	83	2011-851-19
68	2011-851-04	76	2011-851-12	84	2011-851-20
69	2011-851-05	77	2011-851-13	85	2011-851-21
70	2011-851-06	78	2011-851-14	86	2011-851-22
71	2011-851-07	79	2011-851-15	87	2011-851-23
72	2011-851-08	80	2011-851-16		

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 additional 3'-primers, respectively additional 5'-primers.
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	2011-852-01
89	2011-852-02
90	2011-852-03
91	2011-852-04
92	2011-852-05
93	2011-852-06
94	2011-852-07
95	2011-852-08

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 95 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: 2011-October-06

Approved by

Production Quality Control

Declaration of Conformity

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

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

Manufacturer: *Olerup* SSP AB
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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.

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

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

Stockholm, Sweden
2011-October-06

Ann-Cathrin Jareman
Head of QA and Regulatory Affairs

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