

Olerup SSP[®] DQB1 high resolution for frequent alleles

Product number:	101.221-12u – without <i>Taq</i> polymerase
Lot number:	31K
Expiry date:	2012-July-01
Number of tests:	12 tests
Number of wells per test:	47 + 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. 31K.

CHANGES COMPARED TO THE PREVIOUS OLERUP SSP[®] DQB1 HIGH RESOLUTION LOT (09G)

The DQB1 high resolution specificity and interpretation tables have been updated with the DQB1 alleles described since the previous Olerup SSP[®] DQB1 high resolution lot was made (Lot No. 09G).

The amplification patterns for some rare DQB1 alleles only differ by the length of the specific PCR products.

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

Well	5'-primer	3'-primer	rationale
26	Moved, added	Moved, added	Primer pair moved to well 38. New primer pair for the DQB1*06:39 allele.
30	-	Added	Primer added for the DQB1*04:04 allele.
38	Added	-	Primer from well 26.
40	Added	-	Primer added for the DQB1*06:40 allele.
41	Added	-	Primer added for the DQB1*06:38 allele.
43	Added	-	Primer added for the DQB1*06:37 allele.
45	Added	Added	Primer pair added for the DQB1*06:36 allele.
47	-	Added	Increased yield of specific PCR product.

Change in revision R01 compared to R00:

1. Primer mix 37 may give a lower yield of specific PCR product than the other DQB1 high resolution primer mixes.

Change in revision R02 compared to R01:

1. The DQB1*06:28 allele is weakly amplified by primer mix 18.

Well **48** 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'-CAC ^{3'}	5'-Agg ^{3'}	5'-TTA ^{3'}	5'-Tg g ^{3'}	5'-Tg g ^{3'}	5'-Tg g ^{3'}
3'-primer ²	231	2 nd I	507	59	58	57
	5'-TgC ^{3'}	5'-AAA ^{3'}	5'-TTg ^{3'}	5'-CTC ^{3'}	5'-ggC ^{3'}	5'-CTC ^{3'}
A*	+	+	+			
B*	+	+	+			
C*	+	+	+			
DRB1				+	+	
DRB3				+	+	
DRB5				+		
DQB1					+	
DPB1						+

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

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

PRODUCT DESCRIPTION

DQB1 SSP typing

CONTENT

The primer set contains 5'- and 3'-primers for identifying the DQB1*02:01 to DQB1*06:40 alleles.

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

PLATE LAYOUT

Each test consists of 48 PCR reactions in a 48 well cut PCR plate.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48

Wells 1 to 47 – DQB1 primers.

Well 48 – Negative Control.

The 48 well cut PCR plate is marked with ‘DQB1 “HIGH”’ in silver/gray ink.

Well No. 1 is marked with the Lot No. ‘31K’.

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

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

Please note: When removing each 48 well PCR plate, make sure that the remaining plates stay covered. Use a scalpel or a similar instrument to carefully cut the foil between the plates.

INTERPRETATION

Only DQB1 alleles will be amplified by the DQB1 high resolution for frequent alleles typing kit. Thus, the interpretation of DQB1 high resolution for frequent alleles typings is not influenced by the DQB2 or DQB3 genes or other HLA class II genes.

UNIQUELY IDENTIFIED ALLELES

All the phenotypically different DQB1 alleles, i.e. **DQB1*02:01 to 02:05, DQB1*03:01 to 03:26, DQB1*04:01 to 04:04, DQB1*05:01 to 05:05 and DQB1*06:01 to 06:40**, recognized by the HLA Nomenclature Committee in April 2010¹ will give rise to unique amplification patterns by the primers in the DQB1 high resolution for frequent alleles typing kit.

The DQB1 typing kit cannot distinguish the DQB1*02:01:01 and 02:01:02 alleles, the DQB1*03:01:01, 03:01:02 and 03:01:04 alleles, the DQB1*03:02:01 to 03:02:04 alleles, the DQB1*03:03:02 and 03:03:03 alleles, the DQB1*03:05:01 to 03:05:04 alleles, the 04:01:01 and 04:01:02, the DQB1*05:01:01 and 05:01:02 alleles, the DQB1*05:03:01 and 05:03:02 alleles, the DQB1*06:01:01 to 06:01:05 alleles and the DQB1*06:04:01 and 06:04:03 alleles.

The DQB1*06:33 and 06:37 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 43.

¹DQB1 alleles listed on the IMGT/HLA web page 2010-April-01, release 3.0.0, www.ebi.ac.uk/imgt/hla.

RESOLUTION IN HOMO- AND HETEROZYGOTES

The 80 DQB1 alleles generate 89 amplification patterns. These patterns can be combined in 4005 homozygous and heterozygous combinations. 749 of these genotypes do not give rise to unique amplification patterns. (The different lengths of the specific PCR products in lanes 5, 9, 11, 13, 14, 17, 18, 30, 35, 38, 40 to 43 and 46 were not considered in these calculations, nor the differences in product length between the DQB1*6:33 and DQB1*06:37 alleles.)

+++++	+++++	---+	-----	-----	-----	02:02,03:17 = 02:02,03:20
+++	+++	---	-----	-----	-----	02:04,03:17 = 02:04,03:20
+++	+++	---	-----	-----	-----	02:01,05:05 = 02:04,05:02:01 = 02:04,05:05
+++	+++	---	-----	-----	-----	02:01,02:04 = 02:04,02:04
+++	+++	---	-----	-----	-----	02:05,03:17 = 02:05,03:20
+++	+++	---	-----	-----	-----	02:01,03:17 = 02:01,03:20
+++	+++	---	-----	-----	-----	02:01,06:33 = 02:05,06:02:01 = 02:05,06:33
+++	+++	---	-----	-----	-----	02:01,06:26N = 02:05,06:26N
+++	+++	---	-----	-----	-----	02:01,02:05 = 02:05,02:05
+++	+++	---	-----	-----	-----	02:03,03:01 = 02:03,03:01:03
+++	+++	---	-----	-----	-----	02:03,03:17 = 02:03,03:20
+++	+++	---	-----	-----	-----	03:17,05:05 = 03:20,05:05
+++	+++	---	-----	-----	-----	05:02:02,05:05 = 05:03,05:05
+++	+++	---	-----	-----	-----	05:02:01,05:05 = 05:05,05:05
+++	+++	---	-----	-----	-----	03:01,03:08 = 03:08,03:19
+++	+++	---	-----	-----	-----	03:07,03:09 = 03:11,03:16
+++	+++	---	-----	-----	-----	03:07,03:24 = 03:16,03:18
+++	+++	---	-----	-----	-----	03:01,03:07=03:02,03:16 = 03:07,03:16 = 03:07,03:19
+++	+++	---	-----	-----	-----	03:09,03:18 = 03:11,03:24
+++	+++	---	-----	-----	-----	03:01,03:11 = 03:02,03:09 = 03:09,03:11 = 03:11,03:19
+++	+++	---	-----	-----	-----	03:01,03:18 = 03:02,03:24 = 03:18,03:19 = 03:18,03:24
+++	+++	---	-----	-----	-----	03:04,03:17 = 03:04,03:20
+++	+++	---	-----	-----	-----	03:04,03:15 = 03:04,03:16
+++	+++	---	-----	-----	-----	03:01,03:14 = 03:04,03:12 = 03:14,03:19
+++	+++	---	-----	-----	-----	03:01,03,03:14 = 03:04,03:14
+++	+++	---	-----	-----	-----	03:03,03:04 = 03:04,03:19
+++	+++	---	-----	-----	-----	03:05,03:16 = 03:16,03:17 = 03:16,03:20
+++	+++	---	-----	-----	-----	03:05,03:09 = 03:09,03:17 = 03:09,03:20
+++	+++	---	-----	-----	-----	03:05,03:13 = 03:13,03:17 = 03:13,03:20
+++	+++	---	-----	-----	-----	03:05,03:24 = 03:17,03:24 = 03:20,03:24
+++	+++	---	-----	-----	-----	03:05,03:21 = 03:17,03:21 = 03:20,03:21
+++	+++	---	-----	-----	-----	03:05,03:22 = 03:17,03:22 = 03:20,03:22

Lot No.: **31K**

Lot-specific information

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---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:05 = 03:01,03:17 = 03:01,03:20 =
03:01,03,03:17 = 03:01,03,03:20 = 03:17,03:19
= 03:19,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:06,03:09 = 03:09,03:25
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:06,03:13 = 03:13,03:25
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:06,03:24 = 03:24,03:25
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:06,03:21 = 03:21,03:25
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:06,03:22 = 03:22,03:25
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:06 = 03:01,03:25 = 03:01,03,03:06 =
03:06,03:19
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:09,03:15 = 03:09,03:16 = 03:16,03:26
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:10,03:16 = 03:12,03:16
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:13,03:15 = 03:13,03:16
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:15,03:24 = 03:16,03:24
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:15,03:21 = 03:16,03:21
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:15,03:22 = 03:16,03:22
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:15 = 03:01,03:16 = 03:01,03,03:15 =
03:01,03,03:16 = 03:03,03:16 = 03:15,03:16 =
03:15,03:19 = 03:16,03:19
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:09,03:13 = 03:13,03:26
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:26 = 03:01,03,03:26 = 03:03,03:09 =
03:09,03:19 = 03:09,03:26 = 03:19,03:26
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:10,03:13 = 03:12,03:13
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:12 = 03:01,03,03:12 = 03:10,03:19 =
03:12,03:19
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:13,06:04 = 03:13,06:34
---+---+ +---+---+ +---+---+ ----- +---+---+ ----- 03:01,03:13 = 03:01,03,03:13 = 03:03,03:13 =
03:13,03:13 = 03:13,03:19
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:03,03:24 = 03:19,03:24
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:23 = 03:01,03,03:23 = 03:19,03:23
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:03,03:21 = 03:19,03:21
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:03,03:22 = 03:19,03:22
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:03 = 03:01,03:19 = 03:01,03,03:03 =
03:01,03,03:19
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:03,03:19 = 03:19,03:19
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03,03:04 = 03:04,03:04
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:09 = 03:01,03,03:09 = 03:09,03:09
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:10 = 03:01,03,03:10
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:21,06:28 = 03:24,06:40
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,06:28 = 03:24,06:03:01 = 03:24,06:28
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:24 = 03:01,03,03:24
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,06:24 = 03:22,06:02:01 = 03:22,06:24
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,06:23 = 03:21,06:23
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,06:40 = 03:21,06:03:01 = 03:21,06:40
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,06:30 = 03:22,06:30
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,06:17 = 03:22,06:17
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,06:38 = 03:22,06:04 = 03:22,06:38
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:21 = 03:01,03,03:21 = 03:21,03:21
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:22 = 03:01,03,03:22 = 03:22,03:22
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:01,03:01 = 03:01,03,01:03
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:14,03:17 = 03:14,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:03,03:14 = 03:10,03:14 = 03:12,03:14
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:05,03:10 = 03:10,03:17 = 03:10,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:06,03:10 = 03:10,03:25
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:03,03:10 = 03:10,03:12
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:08,03:17 = 03:08,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:07,03:17 = 03:07,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:11,03:17 = 03:11,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:17,03:18 = 03:18,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:17,06:29 = 03:20,06:29
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:17 = 03:02,03:20
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:08,06:28 = 03:18,06:03:02
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:06 = 03:06,03:08
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:08,06:02:01 = 03:08,06:02:02
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:08,06:03:01 = 03:08,06:03:02
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:08 = 03:08,03:08
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:07,03:26 = 03:11,03:15
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:15 = 03:03,03:07 = 03:07,03:15
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:07 = 03:07,03:07
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:26 = 03:03,03:11 = 03:11,03:26
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:11 = 03:11,03:11
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:18,06:03:01 = 03:18,06:28
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 03:02,03:18 = 03:18,03:18
---+---+ +---+---+ ---+---+ ----- +---+---+ ----- 06:04,06:29 = 06:29,06:39



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----	++++	----	----	----	----	03:17,06:02:02 = 03:20,06:02:02
----	++++	----	++++	----	----	03:17,06:03:02 = 03:20,06:03:02
----	++++	----	----	----	----	03:05,03:06 = 03:06,03:17 = 03:06,03:20 =
						03:17,03:25 = 03:20,03:25
----	++++	----	----	----	----	03:05,03:15 = 03:15,03:17 = 03:15,03:20
----	++++	----	----	----	----	03:05,03:26 = 03:17,03:26 = 03:20,03:26
----	++++	----	----	----	----	03:05,03:12 = 03:12,03:17 = 03:12,03:20
----	++++	----	----	----	----	03:17,06:01 = 03:20,06:01
----	++++	++++	----	++++	----	03:17,06:34 = 03:20,06:34
----	++++	----	++++	----	----	03:17,06:28 = 03:20,06:28
----	++++	----	----	----	----	03:17,04:01 = 03:20,04:01
----	++++	++++	----	----	----	03:17,04:04 = 03:20,04:04
----	++++	++++	----	----	----	03:17,04:03:01 = 03:20,04:03:01
----	++++	++++	----	----	----	03:17,04:02 = 03:20,04:02
----	++++	++++	----	----	----	03:17,05:01 = 03:20,05:01
----	++++	++++	+	----	----	03:17,05:02:02 = 03:20,05:02:02
----	++++	++++	+	----	----	03:17,05:02:01 = 03:20,05:02:01
----	++++	++++	+	----	----	03:17,05:03 = 03:20,05:03
----	++++	++++	+	----	----	03:17,06:20 = 03:20,06:20
----	++++	++++	+	----	----	03:17,06:16 = 03:20,06:16
----	++++	++++	+	----	----	03:17,06:24 = 03:20,06:24
----	++++	++++	+	----	----	03:17,06:33 = 03:20,06:33
----	++++	++++	+	----	----	03:17,06:02:01 = 03:20,06:02:01
----	++++	++++	+	----	----	03:17,06:19 = 03:20,06:19
----	++++	++++	+	----	----	03:17,06:11:02 = 03:20,06:11:02
----	++++	++++	+	----	----	03:17,06:11:01 = 03:20,06:11:01
----	++++	++++	+	++++	----	03:17,06:06 = 03:20,06:06
----	++++	++++	+	++++	----	03:17,06:18 = 03:20,06:18
----	++++	++++	+	++++	----	03:17,06:05:02 = 03:20,06:05:02
----	++++	++++	+	++++	----	03:17,06:35 = 03:20,06:35
----	++++	++++	+	++++	----	03:17,06:10 = 03:20,06:10
----	++++	++++	+	++++	----	03:17,06:13 = 03:20,06:13
----	++++	++++	+	++++	----	03:17,06:14:01 = 03:20,06:14:01
----	++++	++++	+	++++	----	03:17,06:15 = 03:20,06:15
----	++++	++++	+	++++	----	03:17,06:14:02 = 03:20,06:14:02
----	++++	++++	+	++++	----	03:17,06:23 = 03:20,06:23
----	++++	++++	+	++++	----	03:17,06:31 = 03:20,06:31
----	++++	++++	+	++++	----	03:17,06:40 = 03:20,06:40
----	++++	++++	+	++++	----	03:17,06:26N = 03:20,06:26N
----	++++	++++	+	++++	----	03:17,06:03:01 = 03:20,06:03:01
----	++++	++++	+	++++	----	03:17,06:07 = 03:20,06:07
----	++++	++++	+	++++	----	03:17,06:32 = 03:20,06:32
----	++++	++++	+	++++	----	03:17,06:30 = 03:20,06:30
----	++++	++++	+	++++	----	03:17,06:08:01 = 03:20,06:08:01
----	++++	++++	+	++++	----	03:17,06:21 = 03:20,06:21
----	++++	++++	+	++++	----	03:17,06:08:02 = 03:20,06:08:02
----	++++	++++	+	++++	----	03:17,06:39 = 03:20,06:39
----	++++	++++	+	++++	----	03:17,06:25 = 03:20,06:25
----	++++	++++	+	++++	----	03:17,06:17 = 03:20,06:17
----	++++	++++	+	++++	----	03:17,06:05:01 = 03:20,06:05:01
----	++++	++++	+	++++	----	03:17,06:27 = 03:20,06:27
----	++++	++++	+	++++	----	03:17,06:22 = 03:20,06:22
----	++++	++++	+	++++	----	03:17,06:04:02 = 03:20,06:04:02
----	++++	++++	+	++++	----	03:05,03:23 = 03:17,03:23 = 03:20,03:23
----	++++	++++	+	++++	----	03:17,06:12 = 03:20,06:12
----	++++	++++	+	++++	----	03:17,06:38 = 03:20,06:38
----	++++	++++	+	++++	----	03:17,06:36 = 03:20,06:36
----	++++	++++	+	++++	----	03:17,06:04 = 03:20,06:04
----	++++	++++	+	++++	----	03:17,06:09 = 03:20,06:09
----	++++	++++	+	++++	----	03:17,05:04 = 03:20,05:04
----	++++	++++	+	++++	----	03:17,04:03:02 = 03:20,04:03:02
----	++++	++++	+	++++	----	03:03,03:17 = 03:03,03:20 = 03:05,03:17 =
						03:05,03:20 = 03:17,03:17 = 03:17,03:20 =
						03:20,03:20
----	++++	----	----	----	----	03:06,03:15 = 03:15,03:25
----	++++	----	----	----	----	03:06,03:26 = 03:25,03:26
----	++++	++++	----	----	----	03:06,03:12 = 03:12,03:25
----	++++	++++	----	----	----	03:06,04:02 = 03:06,04:03:01
----	++++	++++	++++	----	----	03:06,06:02:01 = 03:06,06:02:02
----	++++	++++	++++	----	----	03:06,06:03:01 = 03:06,06:03:02
----	++++	++++	++++	----	----	03:06,06:08:01 = 03:06,06:08:02
----	++++	++++	++++	----	----	03:06,06:04 = 03:06,06:04:02
----	++++	++++	++++	----	----	03:03,03:06 = 03:06,03:06 = 03:06,03:23 =
						03:06,03:25



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---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:25,04:02 = 03:25,04:03:01
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:25,06:02:01 = 03:25,06:02:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:25,06:03:01 = 03:25,06:03:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:25,06:08:01 = 03:25,06:08:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:25,06:04 = 03:25,06:04:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:03,03:15 = 03:15,03:15
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:03,03:26 = 03:26,03:26
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:03,03:12 = 03:12,03:12
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:23,06:08:01 = 03:23,06:08:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 03:23,06:04 = 03:23,06:04:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 04:02,06:10 = 04:03:01,06:10
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 04:04,06:08:01 = 04:04,06:08:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 04:02,06:25 = 04:03:01,06:25
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 04:04,06:04 = 04:04,06:04:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 04:03:01,04:04 = 04:03:02,04:04
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 04:02,04:03:01 = 04:02,04:03:02 =
04:03:01,04:03:01 = 04:03:01,04:03:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:02,06:31 = 06:03:02,06:20
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:03:02 = 06:02:02,06:03:01 =
06:02:02,06:03:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:02,06:04 = 06:02:02,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:02,06:20 = 06:02:02,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:02,06:13 = 06:02:02,06:16
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:02:02 = 06:02:02,06:02:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:03:02,06:11:01 = 06:03:02,06:11:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:03:02,06:14:01 = 06:03:02,06:14:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:03:02,06:04 = 06:03:02,06:04:02 =
06:03:02,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:03:02,06:08:01 = 06:03:02,06:08:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:03:01,06:03:02 = 06:03:02,06:03:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:08:02,06:34 = 06:21,06:34
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:04,06:34 = 06:34,06:34
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:11:01,06:28 = 06:11:02,06:28
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:14:01,06:28 = 06:14:02,06:28
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:04,06:28 = 06:04:02,06:28 = 06:28,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:08:01,06:28 = 06:08:02,06:28
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:03:01,06:28 = 06:28,06:28
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 05:02:01,05:02:02 = 05:02:01,05:03 =
05:02:02,05:02:02 = 05:02:02,05:03
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:31 = 06:03:01,06:20 = 06:20,06:31
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:11:01,06:14:01 = 06:11:02,06:14:01 =
06:11:02,06:14:02
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:26N = 06:11:02,06:33 =
06:26N,06:33
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:30 = 06:24,06:30
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:14:01,06:20 = 06:14:01,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:14:01 = 06:14:01,06:16
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:04,06:20 = 06:20,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:04,06:16 = 06:16,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:38 = 06:04,06:24 = 06:24,06:38 =
06:24,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:04,06:33 = 06:33,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:04 = 06:02:01,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:04,06:19 = 06:19,06:39
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:17 = 06:17,06:24
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:06 = 06:06,06:20
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:05:01 = 06:05:01,06:20 =
06:09,06:20
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:05:02 = 06:05:02,06:20
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:15,06:20 = 06:15,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:14:02,06:20 = 06:14:02,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:20 = 06:16,06:20 = 06:16,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:20,06:23 = 06:23,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:20,06:24 = 06:24,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:20,06:33 = 06:33,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:20 = 06:02:01,06:35 = 06:20,06:20
= 06:20,06:35
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:15 = 06:15,06:16
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:02:01,06:22 = 06:16,06:22
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:14:02 = 06:14:02,06:16
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:23 = 06:16,06:23
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:24 = 06:16,06:24
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:33 = 06:16,06:33
---+----- +---+----- -----+--- -----+--- -----+--- +-----+ 06:13,06:19 = 06:16,06:19



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---+----- ----- +---+----- +-----+ +-----+ 06:02:01,06:13 = 06:02:01,06:16 = 06:13,06:16
= 06:16,06:16
---+----- ----- +---+----- +-----+ +-----+ 06:02:01,06:24 = 06:24,06:24
---+----- ----- +---+----- +-----+ +-----+ 06:02:01,06:33 = 06:33,06:33
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:11:02 = 06:04:02,06:11:02 =
06:11:02,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:06 = 06:06,06:31
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:18 = 06:11:02,06:27
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:05:02 = 06:05:02,06:31
---+----- ----- +---+----- +-----+ +-----+ 06:08:01,06:11:02 = 06:08:02,06:11:02
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:35 = 06:11:01,06:31 =
06:11:02,06:31 = 06:31,06:35
---+----- ----- +---+----- +-----+ +-----+ 06:11:01,06:40 = 06:11:02,06:40
---+----- ----- +---+----- +-----+ +-----+ 06:11:01,06:26N = 06:11:02,06:26N
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:11:01 = 06:03:01,06:11:02
---+----- ----- +---+----- +-----+ +-----+ 06:11:01,06:11:02 = 06:11:02,06:11:02
---+----- ----- +---+----- +-----+ +-----+ 06:08:01,06:11:01 = 06:08:02,06:11:01
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:11:01 = 06:04:02,06:11:01 =
06:04:02,06:18 = 06:11:01,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:06,06:17 = 06:06,06:38
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:06 = 06:06,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:05:02,06:17 = 06:05:02,06:38
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:05:02 = 06:05:02,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:35 = 06:35,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:10 = 06:10,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:13 = 06:13,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:17,06:18 = 06:18,06:38
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:18 = 06:18,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:05:01,06:06 = 06:05:02,06:06 = 06:06,06:06
= 06:06,06:09 = 06:06,06:18 = 06:06,06:35
---+----- ----- +---+----- +-----+ +-----+ 06:05:01,06:05:02 = 06:05:01,06:18 =
06:05:01,06:35 = 06:05:02,06:09 =
06:05:02,06:18 = 06:09,06:35
---+----- ----- +---+----- +-----+ +-----+ 06:05:02,06:05:02 = 06:05:02,06:35
---+----- ----- +---+----- +-----+ +-----+ 05:04,06:10 = 06:10,06:10
---+----- ----- +---+----- +-----+ +-----+ 06:14:01,06:31 = 06:14:02,06:31
---+----- ----- +---+----- +-----+ +-----+ 06:14:01,06:40 = 06:14:02,06:40
---+----- ----- +---+----- +-----+ +-----+ 06:14:01,06:26N = 06:14:02,06:26N
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:14:01 = 06:03:01,06:14:02
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:23 = 06:23,06:40
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:14:01 = 06:14:01,06:39
---+----- ----- +---+----- +-----+ +-----+ 05:04,06:14:01 = 06:14:01,06:14:01 =
06:14:01,06:14:02
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:15 = 06:15,06:36 = 06:15,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:14:02 = 06:14:02,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:23 = 06:23,06:39
---+----- ----- +---+----- +-----+ +-----+ 05:04,06:14:02 = 06:14:02,06:14:02
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:31 = 06:04:02,06:31 = 06:31,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:40 = 06:04:02,06:40 = 06:39,06:40
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:26N = 06:04:02,06:26N = 06:26N,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:36 = 06:07,06:08:01 =
06:07,06:08:02 = 06:07,06:21
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:04 = 06:03:01,06:04:02 =
06:03:01,06:39 = 06:21,06:32
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:17 = 06:21,06:30
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:05:01 = 06:05:01,06:31 =
06:09,06:31
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:09 = 06:12,06:32
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:27 = 06:08:01,06:32 =
06:08:02,06:32
---+----- ----- +---+----- +-----+ +-----+ 06:08:01,06:31 = 06:08:02,06:31
---+----- ----- +---+----- +-----+ +-----+ 06:08:01,06:40 = 06:08:02,06:40
---+----- ----- +---+----- +-----+ +-----+ 06:08:01,06:30 = 06:08:02,06:30
---+----- ----- +---+----- +-----+ +-----+ 06:08:01,06:26N = 06:08:02,06:26N
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:08:01 = 06:03:01,06:08:02
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:31 = 06:31,06:31
---+----- ----- +---+----- +-----+ +-----+ 06:03:01,06:40 = 06:40,06:40
---+----- ----- +---+----- +-----+ +-----+ 06:07,06:17 = 06:07,06:38
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:30 = 06:04:02,06:30 = 06:17,06:32 =
06:30,06:38 = 06:30,06:39 = 06:32,06:38
---+----- ----- +---+----- +-----+ +-----+ 06:07,06:27 = 06:32,06:36
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:07 = 06:04:02,06:07 = 06:07,06:36 =
06:07,06:39
---+----- ----- +---+----- +-----+ +-----+ 06:04,06:32 = 06:04:02,06:32 = 06:32,06:39

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--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:08:01 = 06:04:02,06:08:01 =
06:04:02,06:08:02 = 06:04:02,06:21 =
06:08:01,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ - +-----+ - - - - - + 06:08:01,06:08:01 = 06:08:01,06:08:02
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ +-----+ 06:08:02,06:38 = 06:21,06:38
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - +-----+ 06:08:02,06:25 = 06:21,06:25
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:08:02,06:36 = 06:21,06:36
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:08:02= 06:04,06:21 = 06:08:02,06:39 =
06:21,06:27 = 06:21,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ - +-----+ +-----+ 06:08:02,06:17 = 06:17,06:21
--+----- - - - - - - - - - - - - - - - - +-----++ - +-----+ - - - - - + 06:08:02,06:21 = 06:21,06:21
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:08:02,06:09 = 06:12,06:27
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ +-----+ 06:05:01,06:17 = 06:05:01,06:38
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:05:01 = 06:05:01,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:22 = 06:22,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ +-----+ 06:17,06:25 = 06:25,06:38
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ +-----+ 06:17,06:27 = 06:27,06:38
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ +-----+ 06:04,06:17 = 06:17,06:38 = 06:17,06:39 =
06:38,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - +-----+ 06:04,06:25 = 06:25,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:27 = 06:27,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:39 = 06:39,06:39
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:05:01,06:05:01 = 06:05:01,06:09
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:04:02 = 06:04:02,06:04:02
--+----- - - - - - - - - - - - - - - - - +-----++ +-----+ - - - - - + 06:04,06:36 = 06:36,06:36
```

```
02:01 = 02:01:01-02:01:02
03:01 = 03:01:01, 03:0102 and 03:01:04
03:02 = 03:02:01-03:02:04
03:03 = 03:03:02-03:03:03
03:05 = 03:05:01-03:05:04
04:01 = 04:01:01-04:01:02
05:01 = 05:01:01-05:01:02
05:03 = 05:03:01-05:03:02
06:01 = 06:01:01-06:01:05
06:04 = 06:04:01 and 0604:03
06:33 = 06:33 and 06:37
```



SPECIFICITY TABLE

DQB1 high resolution for frequent alleles SSP typing

Specificities and sizes of the PCR products of the 48 primer mixes used for DQB1 high resolution for frequent alleles SSP typing

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified DQB1 alleles ³
1⁴	120 bp	515 bp	*02:01:01-02:02, 02:04-02:05
2⁴	85 bp	430 bp	*02:03
3	145 bp	515 bp	*02:01:01-02:01:02, 02:04-02:05, 03:01:01-03:23, 03:25-03:26, 04:01:01-04:04, 05:01:01-05:05, 06:01:01-06:37, 06:39-06:40
4⁶	140 bp	430 bp	*02:02-02:03
5^{5,8,9}	145 bp, 185 bp	430 bp	*02:04, 05:05
6⁵	165 bp	515 bp	*03:01:01-03:01:04, 03:04, 03:09, 03:13, 03:16, 03:19, 03:21-03:22, 03:24
7⁵	220 bp	515 bp	*03:01:01-03:01:04, 03:04, 03:09-03:10, 03:13-03:14, 03:16, 03:19, 03:21-03:22, 03:24
8⁵	135 bp	515 bp	*02:01:01-02:02, 02:04-02:05, 03:02:01-03:02:04, 03:07-03:08, 03:11, 03:18, 06:29
9^{5,10}	175 bp, 220 bp	515 bp	*02:01:01-02:05, 03:02:01-03:03:03, 03:05:01-03:08, 03:11-03:12, 03:13 [?] -03:14 [?] , 03:15, 03:16 [?] -03:17 [?] , 03:18-03:20, 03:23, 03:25-03:26, 04:01:01-04:04
10⁷	135 bp	430 bp	*03:04, 03:14
11^{4,8,11}	95 bp, 130 bp	430 bp	*03:05:01-03:05:04, 03:17, 03:20
12⁴	125 bp	430 bp	*03:06, 03:08, 03:25, 06:02:02, 06:03:02
13^{4,5,12}	110 bp, 140 bp	430 bp	*03:07, 03:15-03:16
14¹³	135 bp, 260 bp	430 bp	*03:09, 03:11, 03:26
15⁵	135 bp	430 bp	*03:10, 03:12, 03:14, 06:01:01-06:01:05
16⁵	260 bp	515 bp	*03:01:01-03:01:04, 03:04, 03:09-03:10, 03:12-03:14, 03:16, 03:19, 03:21-03:22, 03:24
17¹⁴	165 bp, 300 bp	430 bp	*03:13, 06:34

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18 ^{7,8,15}	130 bp, 190 bp, 220 bp	430 bp	*03:18, 03:24, 06:28 ^w
19	135 bp	515 bp	*03:01:01-03:15, 03:17-03:22, 03:24, 03:26
20 ⁷	130 bp	430 bp	*02:03, 03:01:01-03:01:02, 03:01:04, 03:03:02-03:03:03, 03:06, 03:09-03:10, 03:12-03:13, 03:15-03:17, 03:19-03:24, 03:26
21 ⁵	205 bp	515 bp	*04:01:01-04:01:02
22 ⁵	205 bp	430 bp	*04:02-04:03:01, 04:04
23	135 bp	430 bp	*05:01:01-05:01:02
24 ⁴	120 bp	430 bp	*05:02:01-05:02:02, 05:05
25 ⁴	95 bp	515 bp	*05:02:02-05:03:02
26 ^{4,5}	115 bp	430 bp	*06:02:01-06:03:02, 06:05:01 [?] -06:08:02 [?] , 06:10 [?] -06:11:02 [?] , 06:13 [?] -06:33 [?] , 06:35 [?] , 06:37 [?] , 06:39, 06:40 [?]
27	210 bp	430 bp	*06:01:01-06:02:02, 06:05:02 [?] -06:06 [?] , 06:10-06:11:02, 06:13, 06:16, 06:18-06:20, 06:24, 06:29, 06:33, 06:35, 06:37
28	185 bp	430 bp	*06:02:01-06:02:02, 06:14:01-06:16, 06:19-06:20, 06:23-06:24, 06:33, 06:37
29	130 bp	430 bp	*06:03:01-06:03:02, 06:07, 06:11:02, 06:14:01, 06:26N, 06:28, 06:30-06:32, 06:40
30 ¹⁶	160 bp, 245 bp	430 bp	*03:06, 03:23, 03:25, 04:04, 06:03:01-06:03:02, 06:04:02, 06:07-06:08:01, 06:11:01-06:11:02, 06:26N, 06:28, 06:30-06:32, 06:40
31	170 bp	515 bp	*06:03:01-06:03:02, 06:08:01-06:08:02, 06:11:02-06:12, 06:14:01, 06:21, 06:26N, 06:28, 06:31, 06:40
32	210 bp	515 bp	*06:04:01-06:04:03, 06:07, 06:17, 06:21, 06:25, 06:34, 06:36, 06:38-06:39
33 ⁷	170 bp	430 bp	*06:04:01-06:07, 06:09, 06:18, 06:25, 06:27, 06:32, 06:34, 06:36, 06:38-06:39
34	130 bp	430 bp	*06:04:01-06:05:01, 06:06, 06:08:01-06:09, 06:12, 06:17-06:18, 06:21, 06:27, 06:34, 06:36, 06:38-06:39
35 ¹⁷	165 bp, 260 bp	515 bp	*06:05:01, 06:05:02 [?] -06:06 [?] , 06:20, 06:31, 06:35

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36	210 bp	430 bp	*06:05:01, 06:05:02 [?] -06:06 [?] , 06:09, 06:12, 06:15 ^w , 06:22 ^w
37⁵	180 bp	430 bp	*03:01:01-03:01:04, 03:04, 03:06 [?] -03:08 [?] , 03:09-03:10, 03:11 [?] -03:18 [?] , 03:20 [?] , 03:21-03:22, 03:23 [?] , 03:24, 03:26 [?] , 06:06
38^{4,18}	100 bp, 120 bp, 185 bp	430 bp	*05:04, 06:10, 06:14:01-06:14:02
39	180 bp	430 bp	*06:13, 06:16, 06:22
40^{4,19}	105 bp, 150 bp	430 bp	*03:21, 06:23, 06:40
41^{6,8,20}	185 bp, 205 bp	430 bp	*03:22, 06:17, 06:24, 06:30, 06:38
42²¹	135 bp, 195 bp	430 bp	*03:06, 03:25, 04:03:01-04:03:02, 06:10, 06:25
43^{4,22}	110 bp, 155 bp, 185 bp, 215 bp, 250 bp	515 bp	*02:05, 06:26N, 06:33, 06:37
44	160 bp	430 bp	*06:02:01-06:02:02, 06:10, 06:13-06:16, 06:20, 06:23-06:24, 06:29, 06:33, 06:37
45	130 bp	515 bp	*06:07, 06:15, 06:36
46²³	160 bp, 210 bp	515 bp	*06:03:01-06:03:02, 06:08:01-06:08:02, 06:14:01-06:14:02, 06:21, 06:27-06:28, 06:30-06:32, 06:40
47⁵	155 bp	430 bp	*04:01:01-04:03:02, 06:19
48²⁴	Neg. Control	-	-

¹Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of DQB1 high resolution typings. When the primers in a primer mix can give rise to specific PCR products of more than one length this is indicated if the size difference is 20 base pairs or more. Size differences shorter than 20 base pairs are not given. For high resolution SSP kits the respective lengths of the specific PCR product(s) of the alleles amplified by these primer mixes are given.

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

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

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

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

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

Well number 1 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DQB1 high resolution for frequent alleles typing.

In addition, wells number 3, 6 to 9, 16, 19, 21, 25, 31, 32, 35, 43, 45 and 46 contain the primer pair giving rise to the longer, 515 bp, internal positive control band in order to allow kit identification.

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

³The DQB1*06:33 and 06:37 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 43.

⁴Specific PCR fragments shorter than 125 base pairs are less intense and not as sharp as longer specific bands.

⁵Primer mixes 6, 7, 8, 9, 15, 16, 21, 22, 26, 37 and 47 may yield less specific PCR products than the other DQB1 primer mixes, most pronounced in primer mixes 26 and 37.

⁶Primer mixes 4, 18 and 41 may give rise to primer oligomer formation.

⁷Primer mixes 10, 18, 20 and 33 may have a weak tendency of nonspecific amplifications.

⁸Primer mixes 5, 11, 18 and 41 have a tendency of giving rise to weaker positive control bands than the other DQB1 high resolution primer mixes.

⁹Primer mix 5: Specific PCR fragment of 145 bp in the DQB1*02:04 allele. Specific PCR fragment of 185 bp in the DQB1*05:05 allele.

¹⁰Primer mix 9: Specific PCR fragment of 175 bp in DQB1*03:05:01-03:05:04, 03:13[?], 03:14[?], 03:16[?], 03:17[?], 03:19, 04:01:01-04:02 and 04:04 alleles. Specific PCR fragment of 220 bp in the DQB1*02:01:01-02:05 alleles. Specific PCR fragments of 175 and 220 bp in the DQB1*03:02:01-03:02:04, 03:03:02-03:03:03, 03:06-03:08, 03:11, 03:12, 03:15, 03:18, 03:20, 03:23, 03:25, 03:26 and 04:03:01-04:03:02 alleles (both specific PCR fragments may not be obtained).

¹¹Primer mix 11: Specific PCR fragment of 95 bp in the DQB1*03:20 allele. Specific PCR fragment of 130 bp in the DQB1*03:05:01-03:05:04 and 03:17 alleles.

¹²Primer mix 13: Specific PCR fragment of 110 bp in the DQB1*03:15 allele. Specific PCR fragment of 140 bp in the DQB1*03:07 and 03:16 alleles.

¹³Primer mix 14: Specific PCR fragment of 135 bp in the DQB1*03:09 allele. Specific PCR fragment of 260 bp in the DQB1*03:11 and 03:26 alleles.

¹⁴Primer mix 17: Specific PCR fragment of 165 bp in the DQB1*03:13 allele. Specific PCR fragment of 300 bp in the DQB1*06:34 allele.

¹⁵Primer mix 18: Specific PCR fragment of 130 bp in the DQB1*03:24 allele. Specific PCR fragment of 190 bp in the DQB1*06:28^w allele. Specific PCR fragment of 220 bp in the DQB1*03:18 allele.

¹⁶Primer mix 30: Specific PCR fragment of 160 bp in DQB1*03:23, 06:03:01-06:03:02, 06:04:02, 06:07-06:08:01, 06:11:01-06:11:02, 06:26N, 06:28, 06:30-06:32 and 06:40 alleles. Specific PCR fragment of 245 bp in the DQB1*03:06, 03:25 and 04:04 alleles.

¹⁷Primer mix 35: Specific PCR fragment of 165 bp in DQB1*06:35 allele. Specific PCR fragment of 260 bp in the DQB1*06:05:01, 06:05:02[?]-06:06[?], 06:20 and 06:31 alleles.

¹⁸Primer mix 38: Specific PCR fragment of 100 bp in DQB1*06:14:01 and 06:14:02 alleles. Specific PCR fragment of 120 bp in the DQB1*05:04 allele. Specific PCR fragment of 185 bp in the DQB1*06:10 allele.

¹⁹Primer mix 40: Specific PCR fragment of 105 bp in the DQB1*06:23 and 06:40 alleles. Specific PCR fragment of 150 bp in the DQB1*03:21 allele.

²⁰Primer mix 41: Specific PCR fragment of 185 bp in the DQB1*06:17, 06:24, 06:30 and 06:38 alleles. Specific PCR fragment of 205 bp in the DQB1*03:22 allele.

²¹Primer mix 42: Specific PCR fragment of 135 bp in the DQB1*06:10 and 06:25 alleles. Specific PCR fragment of 195 bp in the DQB1*03:06, 03:25, 04:03:01 and 04:03:02 alleles.

²²Primer mix 43: PCR fragment of 110 bp in the DQB1*06:37 allele. Specific PCR fragment of 155 bp in the DQB1*02:05 allele. Specific PCR fragments of 185 and 215 bp in the DQB1*06:26N allele. Specific PCR fragment of 250 bp in the DQB1*06:33 allele.

²³Primer mix 46: Specific PCR fragment of 160 bp in the DQB1*06:21 allele. Specific PCR fragment of 210 bp in the DQB1*06:27, 06:30 and 06:32 alleles. Specific PCR fragment of 160 and 210 bp in the *06:03:01-06:03:02, 06:08:01-06:08:02, 06:14:01-06:14:02, 06:28, 06:31 and 06:40 alleles (both specific PCR fragments may not be obtained).

²⁴Primer mix 48 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.

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

'w', might be weakly amplified.

INTERPRETATION TABLE																								
DQB1 high resolution SSP typing																								
Amplification patterns of the DQB1*02:01 to DQB1*06:40 alleles																								
	Well^{5,6}																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Length of spec. PCR product(s)	120	85	145	140	145	165	220	135	175	135	95	125	110	135	135	260	165	130	135	130	205	205	135	120
Length of int. pos. control¹	515	430	515	430	430	515	515	515	515	430	430	430	430	430	430	515	430	430	515	430	515	430	430	430
5'-primer(s)²	5'-AAg ^{3'} 30(185)	5'-TgA ^{3'} 57(266)	5'-TgA ^{3'} 135(500)	5'-TCT ^{3'} 102(400)	5'-CgC ^{3'} 38(209)	5'-ggA ^{3'} 45(230)	5'-TTA ^{3'} 26(173)	5'-TCT ^{3'} 26(173)	5'-TCT ^{3'} 26(173)	5'-TTA ^{3'} 26(173)	5'-ggg ^{3'} 26(173)	5'-gCA ^{3'} 38(210)	5'-ggT ^{3'} 49(242)	5'-gCC ^{3'} 14(136)	5'-ggC ^{3'} 13(134)	5'-ggC ^{3'} 13(134)	5'-TTA ^{3'} 26(173)	5'-TTC ^{3'} 27(175)	5'-gCC ^{3'} 55(260)	5'-TgA ^{3'} 57(266)	5'-gCT ^{3'} 23(164)	5'-gCg ^{3'} 23(164)	5'-ggg ^{3'} 26(173)	5'-gAC ^{3'} 30(184)
3'-primer(s)³	5'-Cgg ^{3'} 57(266)	5'-CgT ^{3'} 71(309)	5'-gAC ^{3'} 170(604)	5'-ggC ^{3'} 135(500)	5'-ACg ^{3'} 86(353)	5'-gCT ^{3'} 86(353)	5'-gCT ^{3'} 86(353)	5'-Cgg ^{3'} 57(266)	5'-gCT ^{3'} 86(353)	5'-Cgg ^{3'} 57(266)	5'-gCg ^{3'} 55(260)	5'-CTA ^{3'} 62(282)	5'-gCT ^{3'} 86(353)	5'-gCT ^{3'} 86(353)	5'-CCC ^{3'} 45(230)	5'-gCT ^{3'} 86(353)	5'-ggT ^{3'} 67(296)	5'-gCT ^{3'} 86(353)	5'-gCT ^{3'} 86(353)	5'-gCT ^{3'} 86(353)	5'-ACg ^{3'} 77(327)	5'-ACg ^{3'} 77(327)	5'-CAA ^{3'} 57(266)	5'-gCT ^{3'} 57(265)
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24



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Length of spec.	120	85	145	140	145	165	220	135	175	135	95	125	110	135	135	260	165	130	135	130	205	205	135	120
PCR product(s)					185				220		130		140	260			300	190						
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
DQB1 allele ⁴																								
*02:01:01-02:01:02	1		3					8	9															
*02:02	1			4				8	9															
*02:03		2		4					9												20			
*02:04	1		3		5			8	9															
*02:05	1		3					8	9															
*03:01:01-03:01:02, 03:01:04			3			6	7								16				19	20				
*03:01:03			3			6	7								16				19					
*03:02:01-03:02:04			3					8	9										19					
*03:03:02-03:03:03			3						9										19	20				
*03:04			3			6	7			10					16				19					
*03:05:01-03:05:04			3						9		11								19					
*03:06			3						9			12							19	20				
*03:07			3					8	9				13						19					
*03:08			3					8	9			12							19					
*03:09			3			6	7							14	16				19	20				
*03:10			3				7								15	16			19	20				
*03:11			3					8	9					14					19					
*03:12			3						9						15	16			19	20				
*03:13			3			6	7		?						16	17			19	20				
*03:14			3				7		?	10					15	16			19					
*03:15			3						9				13						19	20				
*03:16			3			6	7		?				13		16				20					
*03:17			3						?		11								19	20				
*03:18			3					8	9										18	19				
*03:19			3			6	7		9						16				19	20				
*03:20			3						9		11								19	20				
*03:21			3			6	7								16				19	20				
*03:22			3			6	7								16				19	20				
*03:23			3						9											20				
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24



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95 115 210 185				130 160 170 210				170 130 165 210				180 100 180 105				185 135 110 160				130 160 155			Neg. Control	Length of spec. PCR product(s)	
				245						260					120	150	205	195	155		210				
															185				185						
																			215						
																			250						
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Well No. DQB1 allele ⁴	
																									*02:01:01- 02:01:02
																								*02:02	
																								*02:03	
																								*02:04	
																		43						*02:05	
												37												*03:01:01- 03:01:02, 03:01:04	
												37												*03:01:03	
																								*03:02:01- 03:02:04	
																								*03:03:02- 03:03:03	
												37												*03:04	
																								*03:05:01- 03:05:04	
				30								?				42								*03:06	
												?												*03:07	
												?												*03:08	
												37												*03:09	
												37												*03:10	
												?												*03:11	
												?												*03:12	
												?												*03:13	
												?												*03:14	
												?												*03:15	
												?												*03:16	
												?												*03:17	
												?												*03:18	
												?												*03:19	
												?												*03:20	
												37			40									*03:21	
												37				41								*03:22	
				30								?												*03:23	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Well No.	



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Length of spec.	120	85	145	140	145	165	220	135	175	135	95	125	110	135	135	260	165	130	135	130	205	205	135	120
PCR product(s)					185				220		130		140	260			300	190						
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*03:24					6	7										16		18	19	20				
*03:25			3						9			12												
*03:26			3						9				14						19	20				
*04:01:01- 04:01:02			3						9												21			
*04:02			3						9													22		
*04:03:01			3						9													22		
*04:03:02			3						9															
*04:04			3						9													22		
*05:01:01- 05:01:02			3																				23	
*05:02:01			3																					24
*05:02:02			3																					24
*05:03:01- 05:03:02			3																					
*05:04			3																					
*05:05			3		5																			24
*06:01:01- 06:01:05			3												15									
*06:02:01			3																					
*06:02:02			3									12												
*06:03:01			3																					
*06:03:02			3									12												
*06:04:01, 06:04:03			3																					
*06:04:02			3																					
*06:05:01			3																					
*06:05:02			3																					
*06:06			3																					
*06:07			3																					
*06:08:01			3																					
*06:08:02			3																					
*06:09			3																					
*06:10			3																					
*06:11:01			3																					
*06:11:02			3																					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24



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95 115 210 185				130 160 170 210				170 130 165 210				180 100 180 105				185 135 110 160				130 160 155			Neg. Control	Length of spec. PCR product(s)			
					245					260						120	150	205	195	155					210		
																185				185							
																				215							
			250																								
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Negative Control	Well No.		
												37															*03:24
				30													42										*03:25
												?															*03:26
																						47					*04:01:01-
																						47					04:01:02
																	42					47					*04:02
																	42					47					*04:03:01
																	42					47					*04:03:02
				30																							*04:04
																											*05:01:01-
																											05:01:02
																											*05:02:01
25																											*05:02:02
25																											*05:03:01-
																											05:03:02
												38															*05:04
																											*05:05
		27																									*06:01:01-
																											06:01:05
	26	27	28																44							*06:02:01	
	26	27	28																44							*06:02:02	
	26			29	30	31																46				*06:03:01	
	26			29	30	31																46				*06:03:02	
							32	33	34																	*06:04:01,	
																										06:04:03	
				30			32	33	34																	*06:04:02	
	?							33	34	35	36															*06:05:01	
	?	?						33		?	?															*06:05:02	
	?	?						33	34	?	?	37														*06:06	
	?			29	30		32	33														45				*06:07	
	?				30	31			34													46				*06:08:01	
	?					31			34													46				*06:08:02	
								33	34		36															*06:09	
	?	27										38					42		44							*06:10	
	?	27			30																					*06:11:01	
	?	27		29	30	31																				*06:11:02	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Well No.			

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Length of spec.	120	85	145	140	145	165	220	135	175	135	95	125	110	135	135	260	165	130	135	130	205	205	135	120
PCR product(s)					185				220		130		140	260			300	190						
																	220							
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*06:12			3																					
*06:13			3																					
*06:14:01			3																					
*06:14:02			3																					
*06:15			3																					
*06:16			3																					
*06:17			3																					
*06:18			3																					
*06:19			3																					
*06:20			3																					
*06:21			3																					
*06:22			3																					
*06:23			3																					
*06:24			3																					
*06:25			3																					
*06:26N			3																					
*06:27			3																					
*06:28			3															w						
*06:29			3					8																
*06:30			3																					
*06:31			3																					
*06:32			3																					
*06:33, 06:37 ⁷			3																					
*06:34			3														17							
*06:35			3																					
*06:36			3																					
*06:38																								
*06:39			3																					
*06:40			3																					
DQB1 allele ⁴																								
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

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95 115 210 185				130 160 170 210				170 130 165 210				180 100 180 105				185 135 110 160				130 160 155			Neg. Control	Length of spec. PCR product(s)	
					245					260				120	150	205	195	155		210					
														185				185			215				
																		250							
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Well No.	
						31			34		36													*06:12	
	?	27												39					44					*06:13	
	?		28	29		31								38					44	46				*06:14:01	
	?		28											38					44	46				*06:14:02	
	?		28								w								44	45				*06:15	
	?	27	28											39					44					*06:16	
	?						32		34							41								*06:17	
	?	27						33	34															*06:18	
	?	27	28																				47	*06:19	
	?	27	28								35								44					*06:20	
	?					31	32		34												46			*06:21	
	?										w			39										*06:22	
	?		28												40				44					*06:23	
	?	27	28													41			44					*06:24	
	?						32	33										42						*06:25	
	?			29	30	31													43					*06:26N	
	?							33	34												46			*06:27	
	?			29	30	31															46			*06:28	
	?	27																	44					*06:29	
	?			29	30											41					46			*06:30	
	?			29	30	31					35										46			*06:31	
	?			29	30			33													46			*06:32	
	?	27	28																43	44				*06:33, 06:37 ⁷	
							32	33	34															*06:34	
	?	27									35													*06:35	
							32	33	34												45			*06:36	
							32	33	34							41								*06:38	
	26						32	33	34															*06:39	
	?			29	30	31									40						46			*06:40	
																								DQB1 allele ⁴	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Well No.	

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

Well number 1 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DQB1 high resolution for frequent alleles typing.

In addition, wells number 3, 6 to 9, 16, 19, 21, 25, 31, 32, 35, 43, 45 and 46 contain the primer pair giving rise to the longer, 515 bp, internal positive control band in order to allow kit identification.

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

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

⁴The sequence of the DQB1*03:03:1 allele has been shown to be identical to DQB1*03:03:02.

⁵Primer mix 5: Specific PCR fragment of 145 bp in the DQB1*02:04 allele. Specific PCR fragment of 185 bp in the DQB1*05:05 allele.

Primer mix 9: Specific PCR fragment of 175 bp in DQB1*03:05:01-03:05:04, 03:13[?], 03:14[?], 03:16[?], 03:17[?], 03:19, 04:01:01-04:02 and 04:04 alleles. Specific PCR fragment of 220 bp in the DQB1*02:01:01-02:05 alleles. Specific PCR fragments of 175 and 220 bp in the DQB1*03:02:01-03:02:04, 03:03:02-03:03:03, 03:06-03:08, 03:11, 03:12, 03:15, 03:18, 03:20, 03:23, 03:25, 03:26 and 04:03:01-04:03:02 alleles (both specific PCR fragments may not be obtained).

Primer mix 11: Specific PCR fragment of 95 bp in the DQB1*03:20 allele. Specific PCR fragment of 130 bp in the DQB1*03:05:01-03:05:04 and 03:17 alleles.

Primer mix 13: Specific PCR fragment of 110 bp in the DQB1*03:15 allele. Specific PCR fragment of 140 bp in the DQB1*03:07 and 03:16 alleles.

Primer mix 14: Specific PCR fragment of 135 bp in the DQB1*03:09 allele. Specific PCR fragment of 260 bp in the DQB1*03:11 and 03:26 alleles.

Primer mix 17: Specific PCR fragment of 165 bp in the DQB1*03:13 allele. Specific PCR fragment of 300 bp in the DQB1*06:34 allele.

Primer mix 18: Specific PCR fragment of 130 bp in the DQB1*03:24 allele. Specific PCR fragment of 190 bp in the DQB1*06:28^w allele. Specific PCR fragment of 220 bp in the DQB1*03:18 allele.

Primer mix 30: Specific PCR fragment of 160 bp in DQB1*03:23, 06:03:01-06:03:02, 06:04:02, 06:07-06:08:01, 06:11:01-06:11:02, 06:26N, 06:28, 06:30-06:32 and 06:40 alleles. Specific PCR fragment of 245 bp in the DQB1*03:06, 03:25 and 04:04 alleles.

Primer mix 35: Specific PCR fragment of 165 bp in DQB1*06:35 allele. Specific PCR fragment of 260 bp in the DQB1*06:05:01, 06:05:02[?]-06:06[?], 06:20 and 06:31 alleles.

Primer mix 38: Specific PCR fragment of 100 bp in DQB1*06:14:01 and 06:14:02 alleles. Specific PCR fragment of 120 bp in the DQB1*05:04 allele. Specific PCR fragment of 185 bp in the DQB1*06:10 allele.

Primer mix 40: Specific PCR fragment of 105 bp in the DQB1*06:23 and 06:40 alleles. Specific PCR fragment of 150 bp in the DQB1*03:21 allele.

Primer mix 41: Specific PCR fragment of 185 bp in the DQB1*06:17, 06:24, 06:30 and 06:38 alleles. Specific PCR fragment of 205 bp in the DQB1*03:22 allele.

Primer mix 42: Specific PCR fragment of 135 bp in the DQB1*06:10 and 06:25 alleles. Specific PCR fragment of 195 bp in the DQB1*03:06, 03:25, 04:03:01 and 04:03:02 alleles.

Primer mix 43: PCR fragment of 110 bp in the DQB1*06:37 allele. Specific PCR fragment of 155 bp in the DQB1*02:05 allele. Specific PCR fragments of 185 and 215 bp in the DQB1*06:26N allele. Specific PCR fragment of 250 bp in the DQB1*06:33 allele.

Primer mix 46: Specific PCR fragment of 160 bp in the DQB1*06:21 allele. Specific PCR fragment of 210 bp in the DQB1*06:27, 06:30 and 06:32 alleles. Specific PCR fragment of 160 and 210 bp in the *06:03:01-06:03:02, 06:08:01-06:08:02, 06:14:01-06:14:02, 06:28, 06:31 and 06:40 alleles (both specific PCR fragments may not be obtained).

⁹Primer mix 48 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.

⁷The DQB1*06:33 and 06:37 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 43.

'w', might be weakly amplified.

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

CELL LINE VALIDATION SHEET																			
DQB1 high resolution primer set																			
			Production No.	Well															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
				200851401	201074602	200851403	200961804	200851405	201074606	200851407	200851408	200851409	200851410	200851411	200851412	200851413	200851414	200851415	201074616
	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 CTM3953540	*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		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																			
DQB1 high resolution primer set																			
			Production No.	Well															
				17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
				201074617	200961818	200851419	200851420	200851421	200851422	200851423	200851424	200851425	201074626	200851427	200851428	200851429	201074630	200851431	200851432
	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 CTM3953540	*02:01	*0603	-	-	-	-	-	-	-	-	-	+	-	-	+	+	+	-
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		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																				
DQB1 high resolution primer set																				
				Production No.	Well															
					33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
	IHWC cell line	DQB1			200851433	200851434	200961835	200851436	200961837	201074638	200851439	201074640	201074641	200851442	201074643	200851444	201074645	200851446	201074647	
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 CTM3953540	*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® DQB1 high resolution for frequent alleles SSP

Product number: 101.221-12u – without *Taq* polymerase
Lot number: 31K
Expiry date: 2012-July-01
Number of tests: 12 tests
Number of wells per test: 47 + 1

Well specifications:

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
1	2008-514-01	17	2010-746-17	33	2008-514-33
2	2010-746-02	18	2009-618-18	34	2008-514-34
3	2008-514-03	19	2008-514-19	35	2009-618-35
4	2009-618-04	20	2008-514-20	36	2008-514-36
5	2008-514-05	21	2008-514-21	37	2009-618-37
6	2010-746-06	22	2008-514-22	38	2010-746-38
7	2008-514-07	23	2008-514-23	39	2008-514-39
8	2008-514-08	24	2008-514-24	40	2010-746-40
9	2008-514-09	25	2008-514-25	41	2010-746-41
10	2008-514-10	26	2010-746-26	42	2008-514-42
11	2008-514-11	27	2008-514-27	42	2010-746-43
12	2008-514-12	28	2008-514-28	43	2008-514-44
13	2008-514-13	29	2008-514-29	45	2010-746-45
14	2008-514-14	30	2010-746-30	46	2008-514-46
15	2008-514-15	31	2008-514-31	47	2010-746-47
16	2010-746-16	32	2008-514-32		

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

No DNAs carrying the alleles to be amplified by primer solutions 2, 5, 12, 13, 14, 17, 18, 35, 38-43 and 45 were available.

The specificities of the primers in primer solutions 2, 5, 12, 14, 18, 35, 38 to 42 and 45 were tested by separately adding one additional 5'-primer, respectively one additional 3'-primer. In primer solution 17 it was only possible to test the 5'-primers, the 3'-primers were not possible to test. In primer solution 13 and 43 it was only possible to test the 3'-primers, the 5'-primers were not possible to test. In primer solutions 5, 18, 40 and 41 one or two 5'-primers were not possible to test. In primer solutions 14, 18, 39, 41 and 45 one 3'-primer was not possible to test. Additional primers in primer solutions 10, 30, 37 and 46 were tested by separately adding one additional 5'-primer, respectively one additional 3'-primer. The negative control primer pairs, **Production No. 2009-614-01**, 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:

Quality Control, Supervisor

Lot No.: **31K**

Lot-specific information

www.olerup-ssp.com

Declaration of Conformity

Product name: *Olerup* SSP[®] DQB1
Product number: 101.221-12u
Lot number: 31K

Intended use: DQB1 high resolution histocompatibility testing

Manufacturer: *Olerup* SSP AB
Franzengatan 5
SE-112 51 Stockholm, Sweden
Phone: +46-8-717 88 27
Fax: +46-8-717 88 18

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

The Technical Documentation File is maintained at *Olerup* SSP AB, Franzengatan 5, SE-112 51 Stockholm, Sweden.

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

Stockholm, Sweden
2011-October-06

Ann-Cathrin Jareman
Head of QA and Regulatory Affairs

Lot No.: **31K**

Lot-specific information

www.olerup-ssp.com

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