

Olerup SSP® DRB1*14

Product number:	101.117-12/03 – including <i>Taq</i> pol.
Lot number:	77M
Expiry date:	2014-May-01
Number of tests:	12 tests – Product No. 101.117-12 3 tests – Product No. 101.117-03
Number of wells per test:	48
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. 77M.

CHANGES COMPARED TO THE PREVIOUS OLERUP SSP® DRB1*14 LOT

The DRB1*14 specificity and interpretation tables have been updated for the DRB1 alleles reported since the previous *Olerup SSP*® DRB1*14 lot (Lot No. 76K) was made.

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

Well	5'-primer	3'-primer	rationale
18	-	Modified	Increased yield of specific PCR product.
23	-	Modified	Increased yield of specific PCR product.
24	-	Modified	Increased yield of specific PCR product.
26	-	Modified	Increased yield of specific PCR product.
29	-	Added	Primer added for the *14:104 allele.
30	Moved	-	Primer pair to well 44, for improved resolution.
33	-	Modified	Improved specificity of primer pair.
39	-	Added	Primers added for the *14:108 and 14:109 alleles.
40	-	Modified, added	Improved specificity of primer pair, primer added for the *14:107 allele.
43	Added	-	Primer added for the *14:101 allele.
44	Added	Added	Primer pair from well 30, for improved resolution.

PRODUCT DESCRIPTION

DRB1*14 SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for identifying the DRB1*14:01 to DRB1*14:109 alleles.

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

The 48 well cut PCR plate is marked with 'DRB1*14' in silver/gray ink.

Well No. 1 is marked with the Lot No. '77M'.

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

The interpretation of DRB1*14 PCR-SSP subtypings will be influenced by nine DRB1*01, the DRB1*03, nine DRB1*04, most DRB1*08, most DRB1*11, all DRB1*12, all DRB1*13, six DRB1*15 alleles and the DRB1*16:08 allele, when present on the other haplotype. In addition, the DRB3*01:08 allele will be amplified by primer mix 39, the DRB3*01:14 allele will be amplified by primer mixes 5, 18, 22, 24, 28 and 29, and the DRB3*02:16 allele will be amplified by primer mix 25.

UNIQUELY IDENTIFIED ALLELES

All the phenotypically different DRB1*14 alleles, i.e. **DRB1*14:01 to DRB1*14:109**, recognized by the HLA Nomenclature Committee in January 2011¹ will give rise to unique amplification patterns by the primers in the DRB1*14 subtyping kit.

The DRB1*14 subtyping kit cannot distinguish the DRB1*14:01:01-14:01:03 alleles, the DRB1*14:03:01 and 14:03:02 alleles, the DRB1*14:05:01 and 14:05:02 alleles, the DRB1*14:06:01 and 14:06:02 alleles, the DRB1*14:07:01 and 14:07:02 alleles, the DRB1*14:12:01 and 14:12:02 alleles, the DRB1*14:23:01-14:23:03 alleles or the DRB1*14:32:01 and 14:32:02 alleles.

¹DRB alleles listed on the IMGT/HLA web page 2011-January-14, release 3.3.0, www.ebi.ac.uk/imgt/hla.

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Lot-specific information

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RESOLUTION IN HOMO- AND HETEROZYGOTES

A total of 131 alleles generate 110 amplification patterns that can be combined in 6105 homozygous and heterozygous combinations. 1336 of these genotypes do not give rise to unique amplification patterns. The different lengths of the specific PCR products were not considered in these calculations.

+++++--	-----	+-----	+-----	-----	*14:07:01, *14:106 = *14:07:01, *14:108
+++++--	-----	+-----	+-----	-----	*14:02, *14:88 = *14:47, *14:88 = *14:47, *14:92N
+++++--	-----	+-----	+-----	-----	*14:02, *14:38 = *14:38, *14:47 = *14:47, *14:54
+++++--	-----	+-----	+-----	-----	*14:48, *14:75 = *14:48, *14:97 = *14:51, *14:97
+++++--	-----	+-----	+-----	-----	*14:48, *14:54 = *14:48, *14:60 = *14:51, *14:60
+++++--	-----	+-----	+-----	-----	*14:51, *14:87 = *14:51, *14:92N
+++++--	-----	+-----	+-----	-----	*14:62, *14:106 = *14:62, *14:108
+++++--	-----	+-----	+-----	-----	*14:39, *14:106 = *14:39, *14:108
+++++--	-----	+-----	+-----	-----	*14:99, *14:106 = *14:99, *14:108
+++++--	-----	+-----	+-----	-----	*14:06:01, *14:99 = *14:29, *14:54 = *14:29, *14:99
+++++--	-----	+-----	+-----	-----	*14:35, *14:106 = *14:35, *14:108
+++++--	-----	+-----	+-----	-----	*14:90, *14:106 = *14:90, *14:108
+++++--	-----	+-----	+-----	-----	*14:26, *14:106 = *14:26, *14:108
+++++--	-----	+-----	+-----	-----	*14:01:01, *14:106 = *14:01:01, *14:108
+++++--	-----	+-----	+-----	-----	*14:88, *14:106 = *14:88, *14:108
+++++--	-----	+-----	+-----	-----	*14:38, *14:106 = *14:38, *14:108
+++++--	-----	+-----	+-----	-----	*14:97, *14:106 = *14:97, *14:108
+++++--	-----	+-----	+-----	-----	*14:60, *14:106 = *14:60, *14:108
+++++--	-----	+-----	+-----	-----	*14:75, *14:106 = *14:75, *14:108
+++++--	-----	+-----	+-----	-----	*14:82, *14:106 = *14:82, *14:108
+++++--	-----	+-----	+-----	-----	*14:86, *14:106 = *14:86, *14:108
+++++--	-----	+-----	+-----	-----	*14:87, *14:106 = *14:92N, *14:106 = *14:92N, *14:108
+++++--	-----	+-----	+-----	-----	*14:54, *14:106 = *14:54, *14:108
+++++--	-----	+-----	+-----	-----	*14:70, *14:106 = *14:70, *14:108
+++++--	-----	+-----	+-----	-----	*14:06:01, *14:70 = *14:70, *14:83
+++++--	-----	+-----	+-----	-----	*14:58, *14:106 = *14:58, *14:108
+++++--	-----	+-----	+-----	-----	*14:101, *14:106 = *14:101, *14:108
+++++--	-----	+-----	+-----	-----	*14:33, *14:87 = *14:33, *14:92N
+++++--	-----	+-----	+-----	-----	*14:40, *14:90 = *14:75, *14:77 = *14:77, *14:90
+++++--	-----	+-----	+-----	-----	*14:26, *14:40 = *14:26, *14:77 = *14:54, *14:77
+++++--	-----	+-----	+-----	-----	*14:03:01, *14:88 = *14:38, *14:89 = *14:88, *14:89
+++++--	-----	+-----	+-----	-----	*14:03:01, *14:92N = *14:54, *14:89 = *14:89, *14:92N
+++++--	-----	+-----	+-----	-----	*14:41, *14:55 = *14:55, *14:77
+++++--	-----	+-----	+-----	-----	*14:40, *14:87 = *14:55, *14:89
+++++--	-----	+-----	+-----	-----	*14:03:01, *14:55 = *14:40, *14:55
+++++--	-----	+-----	+-----	-----	*14:03:01, *14:87 = *14:87, *14:89
+++++--	-----	+-----	+-----	-----	*14:05:01, *14:49 = *14:49, *14:56
+++++--	-----	+-----	+-----	-----	*14:05:03, *14:49 = *14:49, *14:62
+++++--	-----	+-----	+-----	-----	*14:08, *14:49 = *14:23:01, *14:49
+++++--	-----	+-----	+-----	-----	*14:49, *14:82 = *14:49, *14:101
+++++--	-----	+-----	+-----	-----	*14:26, *14:94 = *14:41, *14:75 = *14:41, *14:90 = *14:90, *14:94
+++++--	-----	+-----	+-----	-----	*14:26, *14:41 = *14:41, *14:54
+++++--	-----	+-----	+-----	-----	*14:88, *14:98 = *14:92N, *14:98
+++++--	-----	+-----	+-----	-----	*14:38, *14:98 = *14:54, *14:98
+++++--	-----	+-----	+-----	-----	*14:60, *14:94 = *14:94, *14:97
+++++--	-----	+-----	+-----	-----	*14:54, *14:94 = *14:75, *14:94
+++++--	-----	+-----	+-----	-----	*14:14, *14:49 = *14:44:01, *14:49
+++++--	-----	+-----	+-----	-----	*14:07:01, *14:49 = *14:44:02, *14:49
+++++--	-----	+-----	+-----	-----	*14:54, *14:78 = *14:62, *14:78
+++++--	-----	+-----	+-----	-----	*14:12:01, *14:55 = *14:55, *14:81
+++++--	-----	+-----	+-----	-----	*14:18, *14:32:01 = *14:18, *14:74
+++++--	-----	+-----	+-----	-----	*14:32:01, *14:81 = *14:74, *14:81
+++++--	-----	+-----	+-----	-----	*14:18, *14:60 = *14:18, *14:104
+++++--	-----	+-----	+-----	-----	*14:18, *14:87 = *14:18, *14:92N
+++++--	-----	+-----	+-----	-----	*14:07:01, *14:55 = *14:44:02, *14:55
+++++--	-----	+-----	+-----	-----	*14:05:01, *14:22 = *14:22, *14:56

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+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:22 = *14:22, *14:62
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:53 = *14:53, *14:56
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:25 = *14:25, *14:56
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:69 = *14:56, *14:69
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:07:01 = *14:07:01, *14:56 = *14:44:01, *14:62
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:07:01 = *14:07:01, *14:62 = *14:44:02, *14:62
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:39 = *14:39, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:08, *14:53 = *14:25, *14:72
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:08, *14:22 = *14:22, *14:23:01 = *14:44:01, *14:105
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:25, *14:35 = *14:53, *14:54
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:22, *14:58 = *14:25, *14:54
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:22, *14:82 = *14:22, *14:101
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:105 = *14:22, *14:54 = *14:44:02, *14:105
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:42 = *14:42, *14:74
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:36 = *14:36, *14:74
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:34 = *14:32:01, *14:44:01 = *14:44:01, *14:74
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:32:01 = *14:14, *14:74
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:16 = *14:16, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:32:01 = *14:07:01, *14:74 = *14:32:01, *14:44:02 =
*14:44:02, *14:74
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:99 = *14:44:02, *14:99
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:72 = *14:35, *14:44:01
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:42, *14:60 = *14:42, *14:104
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:42, *14:87 = *14:42, *14:92N
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:36, *14:60 = *14:36, *14:104
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:90 = *14:36, *14:75 = *14:36, *14:90
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:36, *14:87 = *14:36, *14:92N
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:26 = *14:26, *14:36 = *14:36, *14:54
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:44:01, *14:60 = *14:44:01, *14:104
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:44:01, *14:87 = *14:44:01, *14:92N
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:08 = *14:07:01, *14:23:01 = *14:44:01, *14:54
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:60 = *14:14, *14:104
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:87 = *14:14, *14:92N
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:35 = *14:35, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:90 = *14:44:02, *14:90
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:26 = *14:26, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:07:01 = *14:01:01, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:88 = *14:44:02, *14:88
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:38 = *14:38, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:97 = *14:44:02, *14:97
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:60 = *14:07:01, *14:104 = *14:44:02, *14:60 =
*14:44:02, *14:104
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:75 = *14:44:02, *14:75
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:82 = *14:07:01, *14:101 = *14:44:02, *14:82
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:70 = *14:44:02, *14:70
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:86 = *14:44:02, *14:86
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:87 = *14:07:01, *14:92N = *14:44:02, *14:87 =
*14:44:02, *14:92N
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:54 = *14:44:02, *14:54
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:76 = *14:07:01, *14:79
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:22 = *14:22, *14:44:01
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:22 = *14:22, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:53 = *14:44:01, *14:53
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:25 = *14:25, *14:44:01
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:14, *14:69 = *14:44:01, *14:69
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:14 = *14:07:01, *14:44:01
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:07:01, *14:07:01 = *14:07:01, *14:44:02
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:55, *14:76 = *14:55, *14:79
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:55, *14:103 = *14:75, *14:84
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:55 = *14:54, *14:84 = *14:55, *14:62 = *14:62,
*14:84
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:10, *14:55 = *14:55, *14:57
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:16, *14:55 = *14:32:01, *14:55 = *14:55, *14:74
+++++--- +++++--- +-----+ +-----+ +-----+ +-----+ *14:08, *14:55 = *14:23:01, *14:55

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+++++	-----	++----	-----	-----	-----	*14:55, *14:82 = *14:55, *14:101
+++++	-----	++----	-----	-----	-----	*14:62, *14:76 = *14:62, *14:79
+++++	-----	++----	-----	-----	-----	*14:39, *14:76 = *14:39, *14:79
+++++	-----	++----	-----	-----	-----	*14:31, *14:54 = *14:31, *14:58
+++++	-----	++----	-----	-----	-----	*14:04, *14:32:01 = *14:31, *14:32:01
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:76 = *14:32:01, *14:79
+++++	-----	++----	-----	-----	-----	*14:54, *14:73 = *14:58, *14:73
+++++	-----	++----	-----	-----	-----	*14:28, *14:38 = *14:50, *14:99
+++++	-----	++----	-----	-----	-----	*14:04, *14:99 = *14:28, *14:54 = *14:28, *14:58 = *14:28, *14:99
+++++	-----	++----	-----	-----	-----	*14:76, *14:99 = *14:79, *14:99
+++++	-----	++----	-----	-----	-----	*14:76, *14:90 = *14:79, *14:90
+++++	-----	++----	-----	-----	-----	*14:26, *14:76 = *14:26, *14:79
+++++	-----	++----	-----	-----	-----	*14:54, *14:93 = *14:58, *14:93
+++++	-----	++----	-----	-----	-----	*14:54, *14:68 = *14:58, *14:68
+++++	-----	++----	-----	-----	-----	*14:01:01, *14:76 = *14:01:01, *14:79
+++++	-----	++----	-----	-----	-----	*14:04, *14:88 = *14:50, *14:88 = *14:50, *14:92N
+++++	-----	++----	-----	-----	-----	*14:04, *14:38 = *14:38, *14:50 = *14:50, *14:54 = *14:50, *14:58
+++++	-----	++----	-----	-----	-----	*14:76, *14:88 = *14:79, *14:88
+++++	-----	++----	-----	-----	-----	*14:38, *14:76 = *14:38, *14:79
+++++	-----	++----	-----	-----	-----	*14:76, *14:97 = *14:79, *14:97
+++++	-----	++----	-----	-----	-----	*14:60, *14:76 = *14:60, *14:79
+++++	-----	++----	-----	-----	-----	*14:54, *14:71 = *14:58, *14:71
+++++	-----	++----	-----	-----	-----	*14:04, *14:54 = *14:04, *14:58
+++++	-----	++----	-----	-----	-----	*14:54, *14:107 = *14:58, *14:107
+++++	-----	++----	-----	-----	-----	*14:75, *14:76 = *14:75, *14:79
+++++	-----	++----	-----	-----	-----	*14:76, *14:82 = *14:79, *14:82
+++++	-----	++----	-----	-----	-----	*14:76, *14:86 = *14:79, *14:86
+++++	-----	++----	-----	-----	-----	*14:76, *14:92N = *14:79, *14:92N
+++++	-----	++----	-----	-----	-----	*14:54, *14:76 = *14:54, *14:79 = *14:58, *14:79
+++++	-----	++----	-----	-----	-----	*14:35, *14:76 = *14:35, *14:79
+++++	-----	++----	-----	-----	-----	*14:70, *14:76 = *14:70, *14:79
+++++	-----	++----	-----	-----	-----	*14:76, *14:87 = *14:79, *14:87
+++++	-----	++----	-----	-----	-----	*14:05:03, *14:39 = *14:10, *14:62 = *14:39, *14:62
+++++	-----	++----	-----	-----	-----	*14:05:03, *14:105 = *14:62, *14:105
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:43 = *14:43, *14:74
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:56 = *14:56, *14:74
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:91 = *14:74, *14:91
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:96 = *14:74, *14:96
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:45 = *14:45, *14:74
+++++	-----	++----	-----	-----	-----	*14:05:01, *14:32:01 = *14:05:01, *14:74 = *14:34, *14:62
+++++	-----	++----	-----	-----	-----	*14:05:03, *14:16 = *14:16, *14:62
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:103 = *14:74, *14:103
+++++	-----	++----	-----	-----	-----	*14:05:03, *14:32:01 = *14:05:03, *14:74 = *14:32:01, *14:62 = *14:62, *14:74
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:100 = *14:74, *14:100
+++++	-----	++----	-----	-----	-----	*14:32:01, *14:65 = *14:65, *14:74
+++++	-----	++----	-----	-----	-----	*14:05:03, *14:99 = *14:62, *14:99
+++++	-----	++----	-----	-----	-----	*14:43, *14:60 = *14:43, *14:104
+++++	-----	++----	-----	-----	-----	*14:43, *14:87 = *14:43, *14:92N
+++++	-----	++----	-----	-----	-----	*14:43, *14:54 = *14:43, *14:62
+++++	-----	++----	-----	-----	-----	*14:05:01, *14:35 = *14:62, *14:72
+++++	-----	++----	-----	-----	-----	*14:05:01, *14:90 = *14:26, *14:91 = *14:90, *14:91
+++++	-----	++----	-----	-----	-----	*14:56, *14:60 = *14:56, *14:104
+++++	-----	++----	-----	-----	-----	*14:56, *14:87 = *14:56, *14:92N
+++++	-----	++----	-----	-----	-----	*14:54, *14:56 = *14:56, *14:62
+++++	-----	++----	-----	-----	-----	*14:05:01, *14:97 = *14:60, *14:91 = *14:91, *14:97 = *14:91, *14:104
+++++	-----	++----	-----	-----	-----	*14:60, *14:96 = *14:96, *14:104
+++++	-----	++----	-----	-----	-----	*14:45, *14:60 = *14:45, *14:104
+++++	-----	++----	-----	-----	-----	*14:05:01, *14:60 = *14:05:01, *14:104
+++++	-----	++----	-----	-----	-----	*14:54, *14:100 = *14:62, *14:100
+++++	-----	++----	-----	-----	-----	*14:75, *14:96 = *14:86, *14:91
+++++	-----	++----	-----	-----	-----	*14:87, *14:91 = *14:91, *14:92N
+++++	-----	++----	-----	-----	-----	*14:05:01, *14:75 = *14:54, *14:91 = *14:62, *14:91 = *14:75,

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*14:91
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:87, *14:96 = *14:92N, *14:96
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:86 = *14:54, *14:96 = *14:62, *14:96 = *14:86,
*14:96
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:45, *14:87 = *14:45, *14:92N
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:87 = *14:05:01, *14:92N
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:45, *14:54 = *14:45, *14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:54 = *14:05:01, *14:62 = *14:08, *14:62 =
*14:23:01, *14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:65 = *14:62, *14:65
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:37, *14:54 = *14:37, *14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:35 = *14:35, *14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:90 = *14:26, *14:103 = *14:62, *14:90 = *14:90,
*14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:26 = *14:26, *14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:05:03 = *14:01:01, *14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:88 = *14:62, *14:88
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:38 = *14:38, *14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:97 = *14:60, *14:103 = *14:62, *14:97 = *14:97,
*14:103 = *14:103, *14:104
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:60 = *14:05:03, *14:104 = *14:60, *14:62 = *14:62,
*14:104
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:87, *14:103 = *14:92N, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:75 = *14:54, *14:103 = *14:62, *14:75 = *14:62,
*14:103 = *14:75, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:82 = *14:62, *14:82 = *14:62, *14:101
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:70 = *14:62, *14:70
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:86 = *14:62, *14:86
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:87 = *14:05:03, *14:92N = *14:62, *14:87 = *14:62,
*14:92N
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:54 = *14:05:03, *14:62 = *14:54, *14:62 = *14:62,
*14:62
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:39 = *14:39, *14:74
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:99 = *14:39, *14:99
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:39 = *14:23:01, *14:39
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:39, *14:57 = *14:54, *14:57
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:58 = *14:39, *14:58
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:90 = *14:39, *14:90
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:26 = *14:26, *14:39
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:10 = *14:01:01, *14:39
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:88 = *14:39, *14:88
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:38 = *14:38, *14:39
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:97 = *14:39, *14:97
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:60 = *14:39, *14:60 = *14:39, *14:104
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:75 = *14:39, *14:75
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:82 = *14:39, *14:82 = *14:39, *14:101
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:86 = *14:39, *14:86
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:92N = *14:39, *14:87 = *14:39, *14:92N
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:39 = *14:10, *14:54 = *14:39, *14:39 = *14:39, *14:54
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:105 = *14:23:01, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:82, *14:105 = *14:101, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:99 = *14:74, *14:99
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:16 = *14:16, *14:23:01
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:95 = *14:74, *14:95
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:64 = *14:64, *14:74
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:72 = *14:34, *14:35 = *14:72, *14:74
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:59 = *14:59, *14:74
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:34, *14:82 = *14:34, *14:101
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:32:01 = *14:08, *14:74 = *14:23:01, *14:32:01 =
*14:23:01, *14:74 = *14:34, *14:54
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:16, *14:82 = *14:16, *14:101
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:58 = *14:58, *14:74
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:35 = *14:35, *14:74
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:90 = *14:74, *14:90

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+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:26, *14:32:01 = *14:26, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:32:01 = *14:01:01, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:88 = *14:74, *14:88
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:38 = *14:38, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:97 = *14:74, *14:97
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:60 = *14:60, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:75 = *14:74, *14:75
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:82 = *14:32:01, *14:101 = *14:74, *14:82 = *14:74,
*14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:70 = *14:70, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:86 = *14:74, *14:86
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:92N = *14:74, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:54 = *14:54, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:34 = *14:34, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:87 = *14:74, *14:87
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:32:01, *14:32:01 = *14:32:01, *14:74
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:99 = *14:23:01, *14:99
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:99 = *14:99, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:82, *14:99 = *14:99, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:87, *14:99 = *14:92N, *14:99
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:99 = *14:99, *14:99
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:95 = *14:95, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:64 = *14:64, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:72 = *14:72, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:87, *14:95 = *14:92N, *14:95
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:95 = *14:64, *14:82 = *14:82, *14:95
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:64, *14:87 = *14:64, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:72, *14:87 = *14:72, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:35 = *14:23:01, *14:35 = *14:54, *14:72
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:90 = *14:23:01, *14:90
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:26 = *14:23:01, *14:26
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:08 = *14:01:01, *14:23:01
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:88 = *14:23:01, *14:88
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:38 = *14:23:01, *14:38
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:59, *14:60 = *14:59, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:97 = *14:23:01, *14:97
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:60 = *14:08, *14:104 = *14:23:01, *14:60 = *14:23:01,
*14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:59, *14:87 = *14:59, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:59 = *14:59, *14:86
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:75 = *14:23:01, *14:75
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:82 = *14:08, *14:101 = *14:23:01, *14:82
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:70 = *14:23:01, *14:70
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:86 = *14:23:01, *14:86
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:87 = *14:08, *14:92N = *14:23:01, *14:87 = *14:23:01,
*14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:54 = *14:23:01, *14:54
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:58, *14:60 = *14:58, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:58, *14:87 = *14:58, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:35, *14:60 = *14:35, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:35, *14:82 = *14:35, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:35, *14:87 = *14:35, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:26, *14:97 = *14:60, *14:90 = *14:90, *14:97 = *14:90,
*14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:26, *14:60 = *14:26, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:82, *14:90 = *14:90, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:87, *14:90 = *14:90, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:26, *14:75 = *14:26, *14:90 = *14:54, *14:90 = *14:75, *14:90
= *14:90, *14:90
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:26, *14:82 = *14:26, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:26, *14:87 = *14:26, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:26, *14:26 = *14:26, *14:54
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:60 = *14:01:01, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:82 = *14:01:01, *14:101

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+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:87 = *14:01:01, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:01:01, *14:01:01 = *14:01:01, *14:54
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:88 = *14:88, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:38, *14:60 = *14:38, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:82, *14:88 = *14:88, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:38, *14:82 = *14:38, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:38, *14:87 = *14:38, *14:88 = *14:38, *14:92N = *14:54,
*14:88 = *14:87, *14:88 = *14:88, *14:88 = *14:88, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:38, *14:38 = *14:38, *14:54
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:82, *14:97 = *14:97, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:87, *14:97 = *14:92N, *14:97
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:97 = *14:60, *14:75 = *14:60, *14:97 = *14:75, *14:97
= *14:75, *14:104 = *14:97, *14:97 = *14:97, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:82 = *14:60, *14:101 = *14:82, *14:104 = *14:101,
*14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:70 = *14:70, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:86 = *14:86, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:60, *14:87 = *14:60, *14:92N = *14:92N, *14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:60 = *14:54, *14:104 = *14:60, *14:60 = *14:60,
*14:104
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:75, *14:82 = *14:75, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:75, *14:87 = *14:75, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:75 = *14:75, *14:75
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:70, *14:82 = *14:70, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:82, *14:86 = *14:86, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:82, *14:87 = *14:82, *14:92N = *14:87, *14:101 = *14:92N,
*14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:82 = *14:54, *14:101 = *14:82, *14:82 = *14:82,
*14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:70, *14:87 = *14:70, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:86, *14:87 = *14:86, *14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:86 = *14:86, *14:86
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:54, *14:87 = *14:54, *14:92N = *14:87, *14:92N = *14:92N,
*14:92N
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:64, *14:101 = *14:95, *14:101
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:109 = *14:43, *14:109
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:19 = *14:19, *14:43
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:19, *14:95 = *14:95, *14:109
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:19, *14:64 = *14:64, *14:109
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:19, *14:59 = *14:59, *14:109
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:18, *14:19 = *14:18, *14:109
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:02, *14:95 = *14:51, *14:95
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:02, *14:64 = *14:18, *14:30 = *14:42, *14:106 = *14:42,
*14:108 = *14:51, *14:64
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:36, *14:106 = *14:36, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:44:01, *14:106 = *14:44:01, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:02, *14:59 = *14:51, *14:59
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:09, *14:18 = *14:14, *14:106 = *14:14, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:02, *14:18 = *14:18, *14:51
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:44:02, *14:106 = *14:44:02, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:43, *14:106 = *14:43, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:56, *14:106 = *14:56, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:91, *14:106 = *14:91, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:96, *14:106 = *14:96, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:45, *14:106 = *14:45, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:106 = *14:05:01, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:103, *14:106 = *14:103, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:106 = *14:05:03, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:72, *14:106 = *14:72, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:106 = *14:08, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:06:01, *14:95 = *14:95, *14:106 = *14:95, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:06:01, *14:64 = *14:17, *14:18 = *14:18, *14:33 = *14:64,
*14:106 = *14:64, *14:108
+++++--- +-----+ +-----+ +-----+ +-----+ +-----+ *14:06:01, *14:59 = *14:59, *14:106 = *14:59, *14:108

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+++---	---+++	---+++	---+++	---+++	---+++	*14:18, *14:80 = *14:23:01, *14:106 = *14:23:01, *14:108
+++---	---+++	---+++	---+++	---+++	---+++	*14:06:01, *14:18 = *14:18, *14:106 = *14:18, *14:108
+++---	---+++	---+++	---+++	---+++	---+++	*14:09, *14:64 = *14:14, *14:33
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:17 = *14:42, *14:80
+++---	---+++	---+++	---+++	---+++	---+++	*14:30, *14:64 = *14:33, *14:42
+++---	---+++	---+++	---+++	---+++	---+++	*14:09, *14:42 = *14:14, *14:30
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:21 = *14:21, *14:43
+++---	---+++	---+++	---+++	---+++	---+++	*14:17, *14:59 = *14:33, *14:59
+++---	---+++	---+++	---+++	---+++	---+++	*14:23:01, *14:33 = *14:64, *14:80
+++---	---+++	---+++	---+++	---+++	---+++	*14:17, *14:95 = *14:33, *14:95
+++---	---+++	---+++	---+++	---+++	---+++	*14:17, *14:64 = *14:33, *14:64
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:98 = *14:45, *14:98
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:94 = *14:91, *14:94
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:03, *14:94 = *14:94, *14:103
+++---	---+++	---+++	---+++	---+++	---+++	*14:20, *14:36 = *14:23:01, *14:41
+++---	---+++	---+++	---+++	---+++	---+++	*14:18, *14:44:01 = *14:18, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:77 = *14:36, *14:40 = *14:36, *14:77
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:41 = *14:36, *14:41
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:78 = *14:23:01, *14:78
+++---	---+++	---+++	---+++	---+++	---+++	*14:18, *14:91 = *14:18, *14:103
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:18 = *14:05:03, *14:18
+++---	---+++	---+++	---+++	---+++	---+++	*14:18, *14:95 = *14:20, *14:95 = *14:81, *14:95
+++---	---+++	---+++	---+++	---+++	---+++	*14:18, *14:64 = *14:20, *14:64 = *14:64, *14:81
+++---	---+++	---+++	---+++	---+++	---+++	*14:18, *14:59 = *14:20, *14:59 = *14:59, *14:81
+++---	---+++	---+++	---+++	---+++	---+++	*14:18, *14:18 = *14:18, *14:20 = *14:18, *14:81
+++---	---+++	---+++	---+++	---+++	---+++	*14:20, *14:81 = *14:81, *14:81
+++---	---+++	---+++	---+++	---+++	---+++	*14:43, *14:44:01 = *14:43, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:42, *14:91 = *14:42, *14:103
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:42 = *14:05:03, *14:42
+++---	---+++	---+++	---+++	---+++	---+++	*14:36, *14:91 = *14:36, *14:103
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:36 = *14:05:03, *14:36
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:100 = *14:44:02, *14:100
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:91 = *14:44:01, *14:103 = *14:44:02, *14:91
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:96 = *14:44:02, *14:96
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:45 = *14:44:02, *14:45
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:44:01 = *14:05:01, *14:44:02 = *14:05:03, *14:44:01 = *14:14, *14:56 = *14:44:01, *14:56 = *14:44:02, *14:56
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:91 = *14:14, *14:103
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:14 = *14:05:03, *14:14
+++---	---+++	---+++	---+++	---+++	---+++	*14:34, *14:44:01 = *14:34, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:72 = *14:44:02, *14:72
+++---	---+++	---+++	---+++	---+++	---+++	*14:08, *14:44:01 = *14:08, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:95 = *14:44:02, *14:95
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:64 = *14:44:02, *14:64
+++---	---+++	---+++	---+++	---+++	---+++	*14:44:01, *14:59 = *14:44:02, *14:59
+++---	---+++	---+++	---+++	---+++	---+++	*14:23:01, *14:44:01 = *14:23:01, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:93 = *14:44:01, *14:93
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:68 = *14:44:01, *14:68
+++---	---+++	---+++	---+++	---+++	---+++	*14:11, *14:44:01 = *14:11, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:42, *14:44:01 = *14:42, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:36, *14:44:01 = *14:36, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:36 = *14:36, *14:36
+++---	---+++	---+++	---+++	---+++	---+++	*14:14, *14:44:01 = *14:14, *14:44:02 = *14:44:01, *14:44:01 = *14:44:01, *14:44:02
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:84 = *14:23:01, *14:84
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:93 = *14:56, *14:93
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:68 = *14:56, *14:68
+++---	---+++	---+++	---+++	---+++	---+++	*14:04, *14:34 = *14:31, *14:34
+++---	---+++	---+++	---+++	---+++	---+++	*14:34, *14:76 = *14:34, *14:79
+++---	---+++	---+++	---+++	---+++	---+++	*14:08, *14:76 = *14:08, *14:79
+++---	---+++	---+++	---+++	---+++	---+++	*14:72, *14:76 = *14:72, *14:79
+++---	---+++	---+++	---+++	---+++	---+++	*14:34, *14:91 = *14:34, *14:103
+++---	---+++	---+++	---+++	---+++	---+++	*14:05:01, *14:34 = *14:05:03, *14:34

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+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:11, *14:91 = *14:11, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:11 = *14:05:03, *14:11
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:72, *14:91 = *14:72, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:72 = *14:05:03, *14:72
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:91 = *14:08, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:08 = *14:05:03, *14:08
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:43, *14:91 = *14:43, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:43 = *14:05:03, *14:43 = *14:23:01, *14:43 =
*14:43, *14:43
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:65 = *14:23:01, *14:65
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:37 = *14:23:01, *14:37
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:91, *14:95 = *14:95, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:64, *14:91 = *14:64, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:95 = *14:05:03, *14:95
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:64 = *14:05:03, *14:64
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:56, *14:91 = *14:56, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:56 = *14:05:03, *14:56 = *14:23:01, *14:56 =
*14:56, *14:56
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:59, *14:91 = *14:59, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:59 = *14:05:03, *14:59 = *14:59, *14:96
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:91, *14:100 = *14:100, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:100 = *14:05:03, *14:100 = *14:23:01, *14:100
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:91, *14:96 = *14:96, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:45, *14:91 = *14:45, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:91 = *14:05:01, *14:103 = *14:05:03, *14:91 =
*14:23:01, *14:91 = *14:23:01, *14:103 = *14:91, *14:91 = *14:91,
*14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:96 = *14:05:03, *14:96 = *14:23:01, *14:96 =
*14:96, *14:96
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:45 = *14:05:03, *14:45 = *14:23:01, *14:45 =
*14:45, *14:45
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:01, *14:05:01 = *14:05:01, *14:05:03 = *14:05:01,
*14:23:01 = *14:05:03, *14:23:01
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:05:03, *14:103 = *14:103, *14:103
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:34 = *14:23:01, *14:34
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:08, *14:08 = *14:08, *14:23:01
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:23:01, *14:59 = *14:59, *14:59
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:64, *14:95 = *14:95, *14:95
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:16, *14:27 = *14:40, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:105 = *14:27, *14:74 = *14:27, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:16, *14:77 = *14:74, *14:77
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:16 = *14:16, *14:40 = *14:40, *14:74
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:20, *14:22 = *14:49, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:22 = *14:22, *14:27
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:53 = *14:27, *14:53
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:25 = *14:25, *14:27 = *14:27, *14:69
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:49 = *14:31, *14:49
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:49, *14:76 = *14:49, *14:79
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:53, *14:74 = *14:53, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:25, *14:74 = *14:25, *14:105 = *14:69, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:74 = *14:22, *14:105
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:28 = *14:25, *14:28
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:50 = *14:25, *14:50
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:71 = *14:25, *14:71
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:22 = *14:04, *14:25 = *14:22, *14:31 = *14:25, *14:31
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:93 = *14:25, *14:93
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:68 = *14:25, *14:68
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:107 = *14:25, *14:107
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:76 = *14:22, *14:79 = *14:25, *14:79
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:73 = *14:25, *14:73 = *14:69, *14:73
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:53 = *14:31, *14:53
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:69 = *14:31, *14:69
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:22, *14:25 = *14:22, *14:69
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:25, *14:53 = *14:53, *14:69

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----	----	----	----	----	----	*14:25, *14:25 = *14:25, *14:69
----	----	----	----	----	----	*14:16, *14:84 = *14:74, *14:84
----	----	----	----	----	----	*14:04, *14:105 = *14:31, *14:105
----	----	----	----	----	----	*14:76, *14:105 = *14:79, *14:105
----	----	----	----	----	----	*14:73, *14:74 = *14:73, *14:105
----	----	----	----	----	----	*14:04, *14:16 = *14:16, *14:31
----	----	----	----	----	----	*14:16, *14:76 = *14:16, *14:79
----	----	----	----	----	----	*14:04, *14:74 = *14:31, *14:74
----	----	----	----	----	----	*14:74, *14:76 = *14:74, *14:79
----	----	----	----	----	----	*14:76, *14:104 = *14:79, *14:104
----	----	----	----	----	----	*14:10, *14:16 = *14:16, *14:57 = *14:57, *14:74
----	----	----	----	----	----	*14:74, *14:105 = *14:105, *14:105
----	----	----	----	----	----	*14:15, *14:16 = *14:15, *14:74
----	----	----	----	----	----	*14:16, *14:16 = *14:16, *14:74
----	----	----	----	----	----	*14:02, *14:78 = *14:13, *14:78
----	----	----	----	----	----	*14:03:01, *14:106 = *14:12:01, *14:51
----	----	----	----	----	----	*14:03:01, *14:17 = *14:12:01, *14:30
----	----	----	----	----	----	*14:03:01, *14:80 = *14:09, *14:12:01
----	----	----	----	----	----	*14:06:01, *14:85 = *14:12:01, *14:13
----	----	----	----	----	----	*14:02, *14:12:01 = *14:03:01, *14:06:01
----	----	----	----	----	----	*14:19, *14:33 = *14:21, *14:51 = *14:33, *14:109
----	----	----	----	----	----	*14:19, *14:106 = *14:106, *14:109
----	----	----	----	----	----	*14:02, *14:33 = *14:17, *14:51 = *14:30, *14:106 = *14:33, *14:51
----	----	----	----	----	----	*14:09, *14:106 = *14:51, *14:80
----	----	----	----	----	----	*14:02, *14:106 = *14:06:01, *14:51 = *14:51, *14:106 = *14:51, *14:108
----	----	----	----	----	----	*14:13, *14:21 = *14:21, *14:24
----	----	----	----	----	----	*14:17, *14:109 = *14:21, *14:109
----	----	----	----	----	----	*14:02, *14:21 = *14:17, *14:19 = *14:19, *14:21
----	----	----	----	----	----	*14:06:01, *14:109 = *14:19, *14:108 = *14:108, *14:109
----	----	----	----	----	----	*14:02, *14:17 = *14:06:01, *14:30
----	----	----	----	----	----	*14:02, *14:80 = *14:06:01, *14:09
----	----	----	----	----	----	*14:06:01, *14:48 = *14:48, *14:108
----	----	----	----	----	----	*14:02, *14:63 = *14:13, *14:63 = *14:13, *14:67
----	----	----	----	----	----	*14:02, *14:85 = *14:03:01, *14:13 = *14:13, *14:85
----	----	----	----	----	----	*14:02, *14:50 = *14:04, *14:47 = *14:47, *14:50
----	----	----	----	----	----	*14:19, *14:51 = *14:51, *14:109
----	----	----	----	----	----	*14:02, *14:51 = *14:51, *14:51
----	----	----	----	----	----	*14:13, *14:109 = *14:24, *14:109
----	----	----	----	----	----	*14:13, *14:19 = *14:19, *14:24
----	----	----	----	----	----	*14:19, *14:48 = *14:48, *14:109
----	----	----	----	----	----	*14:02, *14:109 = *14:19, *14:109 = *14:109, *14:109
----	----	----	----	----	----	*14:02, *14:19 = *14:19, *14:19
----	----	----	----	----	----	*14:02, *14:13 = *14:13, *14:13 = *14:13, *14:24
----	----	----	----	----	----	*14:02, *14:98 = *14:47, *14:98
----	----	----	----	----	----	*14:02, *14:47 = *14:47, *14:47
----	----	----	----	----	----	*14:02, *14:48 = *14:48, *14:48
----	----	----	----	----	----	*14:04, *14:29 = *14:06:01, *14:28 = *14:28, *14:29
----	----	----	----	----	----	*14:06:01, *14:52 = *14:20, *14:52
----	----	----	----	----	----	*14:06:01, *14:33 = *14:17, *14:106 = *14:20, *14:33 = *14:33, *14:106 = *14:33, *14:108
----	----	----	----	----	----	*14:06:01, *14:106 = *14:20, *14:106 = *14:106, *14:106 = *14:106, *14:108
----	----	----	----	----	----	*14:06:01, *14:29 = *14:20, *14:29 = *14:29, *14:29
----	----	----	----	----	----	*14:06:01, *14:21 = *14:20, *14:21
----	----	----	----	----	----	*14:06:01, *14:17 = *14:17, *14:20
----	----	----	----	----	----	*14:06:01, *14:80 = *14:20, *14:80
----	----	----	----	----	----	*14:06:01, *14:108 = *14:20, *14:108 = *14:108, *14:108
----	----	----	----	----	----	*14:06:01, *14:83 = *14:20, *14:83 = *14:83, *14:83
----	----	----	----	----	----	*14:06:01, *14:06:01 = *14:06:01, *14:20
----	----	----	----	----	----	*14:09, *14:17 = *14:30, *14:80
----	----	----	----	----	----	*14:17, *14:33 = *14:33, *14:33
----	----	----	----	----	----	*14:17, *14:21 = *14:21, *14:21

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-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:52 = *14:31, *14:52
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:41, *14:84 = *14:77, *14:84
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:84 = *14:40, *14:84
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:78 = *14:24, *14:78 = *14:63, *14:78 = *14:67,
*14:78 = *14:78, *14:85
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:73 = *14:27, *14:73
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:57 = *14:40, *14:57
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:27 = *14:27, *14:27
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:15 = *14:15, *14:40
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:77 = *14:40, *14:41 = *14:40, *14:77 = *14:41,
*14:77 = *14:77, *14:77
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:40 = *14:40, *14:40
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:63 = *14:24, *14:63 = *14:63, *14:63 = *14:63,
*14:67 = *14:63, *14:85 = *14:67, *14:85
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:85 = *14:24, *14:85 = *14:85, *14:85
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:67 = *14:67, *14:67
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:03:01, *14:89 = *14:89, *14:89
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:98 = *14:50, *14:98
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:12:01, *14:78 = *14:20, *14:78 = *14:78, *14:78
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:12:01, *14:12:01 = *14:12:01, *14:20
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:10, *14:76 = *14:10, *14:79
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:11, *14:71 = *14:11, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:11 = *14:11, *14:31
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:31, *14:71 = *14:31, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:31, *14:76 = *14:31, *14:79
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:31 = *14:31, *14:31 = *14:31, *14:61
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:73, *14:76 = *14:73, *14:79
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:61, *14:73 = *14:73, *14:73
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:28, *14:71 = *14:28, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:28, *14:76 = *14:28, *14:79
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:28 = *14:28, *14:28 = *14:28, *14:61
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:71, *14:93 = *14:93, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:68, *14:71 = *14:68, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:93 = *14:68, *14:76 = *14:68, *14:79 = *14:76, *14:93
= *14:79, *14:93
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:61, *14:93 = *14:68, *14:93 = *14:93, *14:93
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:61, *14:68 = *14:68, *14:68
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:50, *14:71 = *14:50, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:50, *14:76 = *14:50, *14:79
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:50 = *14:50, *14:50 = *14:50, *14:61
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:71, *14:76 = *14:71, *14:79
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:71 = *14:04, *14:107 = *14:61, *14:71 = *14:71,
*14:71 = *14:71, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:76 = *14:04, *14:79
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:04, *14:04 = *14:04, *14:61
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:76, *14:107 = *14:79, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:61, *14:107 = *14:107, *14:107
-----+ +-----+ +-----+ +-----+ +-----+ +-----+ *14:61, *14:76 = *14:61, *14:79 = *14:76, *14:79 = *14:79, *14:79

14:01:01 = 14:01:01-14:01:03
14:03:01 = 14:03:01-14:03:02
14:05:01 = 14:05:01-14:05:02
14:06:01 = 14:06:01-14:06:02
14:07:01 = 14:07:01-14:07:02
14:12:01 = 14:12:01-14:12:02
14:23:01 = 14:23:01-14:23:03
14:32:01 = 14:32:01-14:32:02

SPECIFICITY TABLE

DRB1*14 SSP subtyping

Specificities and sizes of the PCR products of the 48 primer mixes used for DRB1*14 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of contr. band ²	Amplified DRB1*14 alleles ³	Other amplified DRB alleles ^{3,4}
1	210 bp	515 bp	*14:01:01-14:01:03, 14:05:01-14:05:03, 14:07:01-14:08, 14:14, 14:18, 14:23:01-14:23:03, 14:26, 14:32:01-14:32:02, 14:34-14:36, 14:38-14:39, 14:42-14:45, 14:54, 14:55 ^w , 14:56, 14:58- 14:60, 14:62, 14:64- 14:65, 14:70, 14:72, 14:75, 14:81-14:82, 14:86-14:88, 14:90- 14:92N, 14:95-14:97, 14:99-14:101, 14:103	*11:13:01-11:13:02, 11:17, 11:52, 11:89
2 ^b	175 bp	430 bp	*14:01:01-14:01:03, 14:07:01-14:07:02, 14:16, 14:22, 14:25-14:26, 14:32:01-14:32:02, 14:35, 14:38-14:39, 14:49, 14:53-14:55, 14:58, 14:60, 14:62, 14:69- 14:70, 14:74-14:75, 14:82, 14:86-14:88, 14:90, 14:92N, 14:97, 14:99, 14:101, 14:104- 14:105	*03:10, 13:43, 13:45
3	140 bp	430 bp	*14:02, 14:06:01- 14:06:02, 14:09, 14:13, 14:17, 14:19, 14:21, 14:29-14:30, 14:33, 14:46-14:48, 14:51-14:52, 14:80, 14:83, 14:106, 14:108-14:109	*13:10, 13:85
4 ⁵	85 bp	430 bp	*14:02-14:03:02, 14:06:01-14:06:02, 14:12:01-14:13, 14:18- 14:20, 14:24, 14:27,	*03:02:01-03:03, 03:27, 03:29, 03:38, 03:53, 13:15, 13:19, 13:26, 13:53, 13:57, 13:85, 13:104

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5	260 bp	430 bp	*14:02-14:03:02, 14:07:01-14:07:02, 14:09, 14:13-14:14, 14:19, 14:22, 14:24-14:25, 14:27, 14:30, 14:36, 14:40-14:42, 14:44:01- 14:44:02, 14:47-14:49, 14:51, 14:53, 14:63, 14:67, 14:69, 14:77, 14:85, 14:89, 14:94, 14:98, 14:102, 14:109	*03:02:01-03:02:02, 03:05:01- 03:05:03, 03:09, 03:14, 03:17, 03:27, 03:29, 03:35, 03:38, 03:40- 03:41, 03:53, 11:01:01-11:01:12, 11:08:01-11:12:02, 11:14:01- 11:15, 11:19:01-11:20, 11:23- 11:24, 11:26-11:29, 11:31-11:33, 11:37, 11:39, 11:45, 11:49:01, 11:51, 11:53, 11:61-11:62, 11:64, 11:66, 11:68-11:69, 11:72-11:75, 11:79-11:82, 11:87, 11:90-11:91, 11:93-11:97, 11:99-11:101, 13:02:01-13:02:03, 13:03:01- 13:03:06, 13:05:01-13:05:02, 13:07:01-13:07:02, 13:12:01- 13:14:03, 13:21:01-13:21:02, 13:23:01-13:23:02, 13:25-13:26, 13:29-13:31, 13:33:01-13:34, 13:36-13:39, 13:41, 13:45-13:47, 13:49-13:50:02, 13:55-13:56, 13:60, 13:62-13:63, 13:65- 13:66:02, 13:73-13:74, 13:82, 13:85-13:86, 13:88, 13:90, 13:95- 13:97, 13:99-13:101, 13:104, 13:107, DRB3*01:14
6	260 bp	515 bp	*14:01:01-14:01:03, 14:05:01-14:06:02, 14:08, 14:12:01-14:12:02, 14:16- 14:18, 14:20-14:21, 14:23:01-14:23:03, 14:26, 14:29, 14:32:01-14:35, 14:37-14:39, 14:43, 14:45, 14:54-14:56, 14:58-14:60, 14:62, 14:64-14:65, 14:70, 14:72, 14:74-14:75, 14:78, 14:80-14:84, 14:86-14:88, 14:90- 14:92N, 14:95-14:97, 14:99-14:101, 14:103- 14:106, 14:108	*03:01:01:01-03:01:11, 03:03- 03:04:01, 03:06-03:08, 03:10- 03:13:02, 03:15-03:16, 03:18- 03:26, 03:28, 03:30-03:34, 03:36- 03:37, 03:39, 03:43-03:52, 03:54- 03:56, 03:58-03:60, 08:20, 11:02:01-11:04:07, 11:06:01- 11:07, 11:13:01-11:13:02, 11:16- 11:18, 11:21, 11:25, 11:34-11:36, 11:38, 11:40-11:44, 11:46:01- 11:48, 11:50, 11:52, 11:54:01- 11:60, 11:63, 11:65:01-11:65:02, 11:70, 11:76-11:78, 11:83-11:85, 11:88-11:89, 11:92, 11:98, 11:102, 13:01:01-13:01:08, 13:04, 13:06, 13:08-13:11:02, 13:15,

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7	225 bp	430 bp	*14:03:01-14:03:02, 14:12:01-14:12:02, 14:27, 14:40, 14:55, 14:63, 14:67, 14:77-14:78, 14:84-14:85, 14:89, 14:102	*08:20, 11:23, 11:25, 11:45, 11:55, 11:64, 13:13, 13:18, 13:47, 13:55
8	170 bp	430 bp	*14:04, 14:28, 14:31, 14:50, 14:61, 14:68, 14:71, 14:73, 14:76, 14:79, 14:93, 14:107	*08:08, 08:11 ^w
9^{5,9}	130 bp, 250 bp	430 bp	*14:05:01-14:05:03, 14:37, 14:43, 14:45, 14:56, 14:62, 14:65, 14:78, 14:84, 14:91, 14:96, 14:100, 14:103	*03:12, 04:10-04:12, 04:67, 04:91, 08:06, 08:10, 08:12, 08:22, 13:04, 13:32, 13:48, 13:58, 13:72, 13:75, 13:81, 13:89, 13:93-13:94, 13:108, 15:12
10	175 bp	430 bp	*14:10, 14:39, 14:57	*04:62, 04:69
11^{5,10}	85 bp, 170 bp, 215 bp	430 bp	*14:11, 14:16, 14:22, 14:25, 14:31-14:32:02, 14:34, 14:49, 14:52-14:53, 14:69, 14:74, 14:105	*01:14, 04:62, 08:05, 08:18, 08:24-08:25, 08:31, 08:40-08:41, 11:67, 12:01:01-12:21, 12:23-12:26, 13:17, 13:43, 13:45
12	225 bp	515 bp	*14:01:01-14:01:03, 14:05:01-14:05:03, 14:07:01-14:08, 14:14, 14:18, 14:23:01-14:23:03, 14:26, 14:33, 14:35-14:36, 14:38-14:39, 14:42-14:45, 14:51, 14:54, 14:56, 14:58-14:60, 14:62, 14:64, 14:70, 14:72, 14:75, 14:82, 14:86, 14:88, 14:90-14:92N, 14:95-14:97, 14:99, 14:101, 14:103, 14:106	*03:11:01-03:11:02, 03:17, 03:24, 03:27, 03:35, 11:17, 11:52-11:54:02, 11:89, 13:76
13^{5,7}	115 bp	430 bp	*14:01:01-14:01:03, 14:04, 14:07:01-14:08, 14:10, 14:16, 14:22,	*03:10, 11:52, 13:43

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14 ^{5,11}	60 bp, 130 bp	515 bp	*14:22, 14:25, 14:27, 14:53, 14:73, 14:105	*08:08, 11:09, 11:28:01-11:28:02, 11:58:01-11:58:02, 11:83, 11:87, 13:05:01-13:05:02, 13:18, 13:26, 13:42, 13:50:01-13:50:02, 16:08
15	185 bp	430 bp	*14:28-14:29, 14:99	*03:20, 12:05, 12:14-12:15
16 ^{5,7,8}	105 bp	430 bp	*14:05:01-14:05:02, 14:08, 14:11, 14:14, 14:18, 14:23:01-14:23:03, 14:34, 14:36, 14:42-14:44:01, 14:45, 14:56, 14:59, 14:64, 14:72, 14:91, 14:95-14:96, 14:100	*01:02:01-01:02:05, 01:23, 01:26, 01:34, 11:01:05, 11:01:10, 11:04:03, 11:06:02, 11:13:01-11:13:02, 11:17, 11:52, 11:54:01, 12:04, 12:09, 13:01:03, 13:76
17	220 bp	430 bp	*14:19, 14:21, 14:43, 14:109	*11:73, 11:79, 11:93, 13:03:01-13:03:06, 13:10, 13:33:01-13:33:03, 13:37, 13:66:01-13:66:02, 13:81, 13:85, 13:88-13:90, 13:94-13:95, 13:101
18 ^{5,7}	85 bp	430 bp	*14:01:01-14:01:03, 14:05:01-14:05:03, 14:07:01-14:09, 14:14, 14:16-14:17, 14:21-14:23:03, 14:25-14:26, 14:30, 14:32:01-14:39, 14:42-14:45, 14:53-14:56, 14:58-14:60, 14:62, 14:64-14:65, 14:69, 14:72, 14:74-14:75, 14:80, 14:82, 14:84, 14:86-14:88, 14:90-14:92N, 14:95-14:97, 14:99-14:101, 14:103-14:105	*03:01:01:01-03:01:11, 03:04:01-03:26, 03:28, 03:30-03:37, 03:39-03:41, 03:43-03:52, 03:54-03:59, 08:20, 11:01:01-11:04:07, 11:06:01-11:21, 11:23-11:29, 11:31-11:66, 11:68-11:70, 11:73-11:91, 11:93-11:102, 13:01:01-13:14:03, 13:16, 13:18, 13:20-13:25, 13:27-13:52, 13:54-13:56, 13:58-13:66:02, 13:68-13:84, 13:87-13:100, 13:102, 13:105-13:113N, DRB3*01:14
19	145 bp	430 bp	*14:15-14:16, 14:40, 14:55, 14:57, 14:77, 14:84	*08:09, 08:21, 08:35, 13:08, 13:19, 13:57, 13:64, 13:72, 13:76, 13:83, 13:107

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20 ^{5,12}	110 bp, 160 bp, 215 bp,	430 bp	*14:04, 14:15, 14:25, 14:28, 14:31, 14:50, 14:53, 14:58, 14:68- 14:69, 14:71, 14:73, 14:76, 14:79, 14:93, 14:102, 14:107	*08:01:01-08:04:06, 08:06-08:17, 08:19-08:23, 08:26-08:28, 08:30:01-08:30:02, 08:32-08:39, 08:42, 11:23, 11:25, 11:45, 11:55, 11:64, 11:67, 13:13, 13:45, 13:47, 13:55
21 ¹³	170 bp, 215 bp	515 bp	*14:13, 14:24, 14:37, 14:63, 14:65, 14:78, 14:85	*03:12, 11:69, 11:82, 13:03:01- 13:04, 13:09, 13:12:01-13:13, 13:21:01-13:21:02, 13:30, 13:32- 13:33:03, 13:38, 13:48-13:49, 13:55, 13:58, 13:65-13:66:02, 13:75, 13:81, 13:88-13:90, 13:93- 13:95, 13:101, 13:108
22	145 bp	430 bp	*14:01:01-14:03:02, 14:05:01-14:09, 14:12:01- 14:14, 14:16, 14:18- 14:20, 14:22-14:27, 14:29, 14:32:01-14:32:02, 14:34, 14:36-14:41, 14:43-14:45, 14:47-14:49, 14:51, 14:54-14:56, 14:58-14:60, 14:62-14:63, 14:67, 14:69-14:70, 14:74-14:75, 14:77-14:78, 14:80-14:92N, 14:94, 14:96-14:106, 14:108- 14:109	*03:02:01-03:03, 03:06, 03:17, 03:26-03:27, 03:31, 03:35, 03:38, 03:41, 03:60, 08:20, 11:17, 11:37, 11:41, 11:48, 11:50, 11:52, 11:56, 11:83, 13:03:01-13:03:06, 13:07:01-13:08, 13:12:01-13:13, 13:19, 13:26, 13:32-13:33:03, 13:36-13:38, 13:40, 13:47-13:49, 13:53, 13:55, 13:58, 13:60, 13:65, 13:70, 13:72, 13:76, 13:81, 13:84- 13:85, 13:88-13:90, 13:94-13:95, 13:101, 13:108, DRB3*01:14
23 ⁶	145 bp	430 bp	*14:17, 14:21, 14:30, 14:33, 14:35, 14:42, 14:53, 14:64-14:65, 14:72, 14:95	*03:01:01:01-03:01:11, 03:04:01- 03:05:03, 03:07-03:15, 03:18- 03:25, 03:28-03:30, 03:32-03:34, 03:36-03:37, 03:39-03:40, 03:43- 03:52, 03:54-03:59, 11:01:01- 11:01:06, 11:01:08-11:04:07, 11:06:01-11:16, 11:18-11:21, 11:23-11:29, 11:31-11:36, 11:38- 11:40, 11:42-11:47, 11:49:01, 11:51, 11:53-11:55, 11:57-11:66, 11:68-11:70, 11:72-11:82, 11:84- 11:87, 11:89-11:102, 13:01:01- 13:02:04, 13:04-13:06, 13:09- 13:11:02, 13:14:01-13:16, 13:18, 13:20-13:25, 13:27-13:31, 13:34, 13:39, 13:41-13:46, 13:50:01-13:52, 13:54, 13:56- 13:57, 13:59, 13:61:01-13:64, 13:66:01-13:66:02, 13:68-13:69, 13:71, 13:73-13:75, 13:77-13:79, 13:82-13:83, 13:86-13:87,

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24 ^{5,14}	75 bp, 125 bp, 165 bp	430 bp	*14:26, 14:36, 14:41, 14:77, 14:90	*03:18, 03:43, 11:76, 13:34, 13:64, 13:92, DRB3*01:14
25 ^{5,15}	120 bp, 210 bp, 250 bp	430 bp	*14:07:01-14:07:02, 14:22, 14:25, 14:44:01- 14:44:02, 14:49, 14:53, 14:56, 14:68-14:69, 14:93	*01:14, 03:35, 04:62, 04:69, 08:08, 08:15, 13:45, DRB3*02:16
26	250 bp	515 bp	*14:01:01-14:01:03	
27	220 bp	515 bp	*14:46	
28 ¹⁶	160 bp, 230 bp	430 bp	*14:38, 14:47, 14:50, 14:88, 14:98	*03:01:02, 03:02:02, 03:05:03, 03:11:02, 03:13:02, 03:17, 03:24, 03:27, 03:35, 11:27:01, 11:84, 12:22, 13:33:02-13:33:03, 13:61:01, DRB3*01:14
29 ^{5,17}	125 bp, 175 bp, 220 bp	515 bp	*14:48, 14:60, 14:97, 14:104	*03:14-03:15, 03:26, 03:33, 03:38, 03:44, 11:44, 11:49:01-11:50, 11:85, 13:31, 13:46, 13:54, 13:77, 13:100, 13:106, DRB3*01:14
30	190 bp	430 bp	*14:06:01-14:06:02, 14:12:01-14:12:02, 14:17- 14:18, 14:21, 14:29, 14:33, 14:52, 14:59, 14:64, 14:78, 14:80- 14:81, 14:83, 14:95, 14:106, 14:108	*03:01:01:01-03:01:11, 03:03, 03:06-03:08, 03:10-03:13:02, 03:15-03:16, 03:18-03:20, 03:22- 03:24, 03:26, 03:28, 03:32-03:34, 03:36-03:37, 03:39, 03:42, 03:45- 03:48, 03:50-03:51, 03:54-03:56, 03:58-03:60, 11:16, 11:40, 11:58:01, 11:59, 11:83, 13:01:01- 13:01:08, 13:06, 13:09-13:10, 13:15, 13:18, 13:20, 13:27-13:28, 13:32, 13:35, 13:40, 13:42-13:43, 13:51, 13:53, 13:59, 13:61:01, 13:69, 13:71, 13:77-13:80, 13:87, 13:91-13:93, 13:98, 13:102, 13:105, 13:110-13:113N, 15:32
31 ⁵	80 bp	515 bp	*14:35, 14:53, 14:72	*03:10, 11:31, 11:96, 13:43, 13:45
32 ^{5,18}	100 bp, 145 bp	430 bp	*14:13, 14:19, 14:21, 14:63, 14:78, 14:85, 14:109	*03:12, 13:10, 13:32, 13:65, 13:85, 13:93
33	175 bp	430 bp	*14:01:01-14:01:03, 14:07:01-14:08, 14:16, 14:22, 14:25-14:26, 14:32:01-14:32:02, 14:34- 14:35, 14:38-14:39, 14:49, 14:53-14:55,	*03:10, 13:43, 13:45

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			14:58, 14:60, 14:62, 14:69-14:70, 14:74-14:75, 14:82, 14:86-14:88, 14:90, 14:92N, 14:97, 14:99, 14:104-14:105	
34	205 bp	515 bp	*14:04, 14:11, 14:28, 14:31, 14:50, 14:68, 14:71, 14:93	
35	250 bp	430 bp	*14:04, 14:11, 14:15, 14:28, 14:31, 14:50, 14:52, 14:71, 14:73, 14:76, 14:79, 14:107	*08:04:01, 08:04:04-08:04:06, 08:06, 08:10, 08:12, 08:22, 08:28, 08:31, 11:67, 12:01:01-12:15, 12:17-12:21, 12:23-12:26, 13:17
36⁵	130 bp	515 bp	*14:63, 14:67, 14:78	*11:16, 11:20, 13:01:01-13:01:06, 13:01:08-13:02:04, 13:06, 13:10, 13:15-13:16, 13:27-13:28, 13:31- 13:32, 13:34-13:36, 13:39-13:41, 13:51, 13:53, 13:59, 13:61:01, 13:65, 13:67, 13:69, 13:73, 13:77, 13:79-13:80, 13:85, 13:87, 13:91- 13:93, 13:96:01, 13:98-13:99, 13:102-13:105, 13:109-13:110, 13:112-13:113N
37	175 bp	430 bp		*03:08, 11:01:01-11:04:07, 11:06:01-11:21, 11:23-11:29, 11:31-11:66, 11:68-11:70, 11:72- 11:102
38	215 bp	515 bp	*14:37, 14:100	*13:72
39^{5,19}	120 bp, 155 bp	430 bp	*14:18, 14:33, 14:48, 14:51, 14:59, 14:64, 14:95, 14:106, 14:108- 14:109	*03:11:01, 03:13:01-03:13:02, 03:38, 03:58, 13:39, 13:77-13:79, DRB3*01:08
40^{8,20}	215 bp, 250 bp	430 bp	*14:71, 14:107	
41^{5,21}	115 bp, 165 bp, 245 bp	430 bp	*14:75, 14:90-14:91, 14:94, 14:97, 14:103	*03:04:01, 03:26, 03:33, 03:44, 11:29, 11:44, 11:47, 11:49:01- 11:50, 11:63, 11:85, 13:60, 13:84, 13:106
42	225 bp	515 bp	*14:76, 14:79, 14:93	
43^{5,22}	95 bp, 200 bp	430 bp	*14:82, 14:95, 14:101	
44	215 bp	515 bp	*14:70, 14:83	*15:03:01:01-15:03:01:02, 15:23
45⁵	125 bp	515 bp	*14:59, 14:86, 14:96	

46 ^{5,8,23}	105 bp, 165 bp, 210 bp, 225 bp	515 bp	*14:87-14:89, 14:92N	
47 ^{5,7}	60 bp	430 bp	*14:63, 14:67, 14:78	*04:12, 04:18, 04:86, 08:03:02, 08:10, 08:12, 08:14-08:15, 08:19, 08:23, 08:27, 08:30:01-08:30:02, 08:32-08:38, 11:45, 13:13, 15:21
48 ^{5,24}	65 bp, 190 bp, 225 bp	430 bp	*14:45, 14:98	*03:35, 11:27:01, 11:84, 12:22, 13:33:02-13:33:03, 13:61:01

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 DRB1*14 SSP typings.

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

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

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

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

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

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 longer, 515 bp, internal positive control band in order to help in the correct orientation of the DRB1*14 subtyping.

In addition, wells number 6, 12, 14, 21, 26, 27, 29, 31, 34, 36, 38, 42 and 44 to 46 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 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 sets 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*01:01 consensus sequence.

⁴ Due to the sharing of sequence motifs within the DR52 group of DRB1 alleles, non-DRB1*13 alleles will be amplified by primer mixes 1 to 25, 28 to 33, 35 to 39, 41, 44, 47 and 48. In addition, the DRB3*01:08 allele will be amplified by primer mix 39, the DRB3*01:14 allele will be amplified by primer mixes 5, 18, 22, 24, 28 and 29, and the DRB3*02:16 allele will be amplified by primer mix 25.

⁵ Short specific PCR fragments are less intense and not as sharp as longer specific bands.

⁶ Primer mix 23 has a tendency of giving rise to nonspecific amplifications.

⁷ Primer mixes 13, 16, 18 and 47 may yield less specific PCR product than the other DRB1*14 primer mixes.

⁸ Primer mixes 2, 16, 40 and 46 may have tendencies of giving rise to primer oligomer formation.

⁹ Primer mix 9: Specific PCR fragment of 130 bp in the DRB1*14:62, 14:65 and 14:78 and the DRB1*03:12, 04:10-04:12, 04:67, 04:91, 08:06, 08:10, 08:12, 08:22, 13:04, 13:32, 13:48, 13:58, 13:75, 13:81, 13:89, 13:93-13:94, 13:108 and 15:122 alleles. Specific PCR fragment of 250 bp in the DRB1*14:05:01-14:05:03, 14:37, 14:43, 14:45, 14:56, 14:84, 14:91, 14:96, 14:100 and 14:103 and the DRB1*13:72 alleles.

¹⁰ Primer mix 11: Specific PCR fragment of 85 bp in the DRB1*14:16, 14:22, 14:25, 14:32:01-14:32:02, 14:34, 14:49, 14:53, 14:69, 14:74 and 14:105 and the DRB1*01:14, 04:62, 13:43 and 13:45 alleles. Specific PCR fragment of 170 bp in the DRB1*14:11 and the DRB1*11:67 alleles. Specific PCR fragment of 215 bp in the DRB1*14:52 and the DRB1*08:05, 08:18, 08:24-08:25, 08:40, 12:01:01-12:03:02, 12:05-12:21, 12:23-12:26 and 13:17 alleles. Specific

PCR fragment of 85 and 215 bp in the DRB1*14:31 allele. Specific PCR fragment of 170 and 215 bp in the DRB1*08:31, 08:41 and 12:04 alleles.

¹¹Primer mix 14: Specific PCR fragment of 60 bp in the DRB1*14:22, 14:25, 14:53, 14:73 and 14:105 and the DRB1*08:08 alleles. Specific PCR fragment of 130 bp in the DRB1*14:27 and the DRB1*11:09, 11:28:01-11:28:02, 11:58:01-11:58:02, 11:83, 11:87, 13:05:01-13:05:02, 13:18, 13:26, 13:42, 13:50:01-13:50:02 and 16:08 alleles.

¹²Primer mix 20: Specific PCR fragment of 110 bp in the DRB1*14:25, 14:53, 14:58 and 14:69 and the DRB1*13:45 alleles. Specific PCR fragment of 160 bp in the DRB1*14:04, 14:28, 14:31, 14:50, 14:68, 14:71, 14:73, 14:76, 14:79, 14:93, 14:102 and 14:107 and the DRB1*08:20, 11:23, 11:25, 11:45, 11:55, 11:64, 13:13, 13:47 and 13:55 alleles. Specific PCR fragment of 215 bp in the DRB1*14:15 and the DRB1*08:09, 08:21, 08:27, 08:32, 08:35 and 08:38 alleles. Specific PCR fragments of 160 and 215 bp in the DRB1*08:01:01-08:04:06, 08:06-08:07, 08:10-08:17, 08:19, 08:22-08:23, 08:26, 08:28, 08:30:01-08:30:02, 08:33-08:34, 08:36-08:37, 08:39, 08:42 and 11:67 alleles. Specific PCR fragments of 110, 160 and 215 bp in the DRB1*08:08 alleles. Not all specific PCR fragments may be obtained in alleles being amplified by more than one primer pair.

¹³Primer mix 21: Specific PCR fragment of 170 bp in DRB1*14:13, 14:63, 14:65, 14:78 and 14:85 and the DRB1*03:12, 13:03:01-13:04, 13:12:01-13:13, 13:21:01-13:21:02, 13:30, 13:32-13:33:03, 13:38, 13:48-13:49, 13:55, 13:58, 13:65-13:66:02, 13:75, 13:81, 13:88-13:90, 13:93-13:95, 13:101 and 13:108 alleles. Specific PCR fragment of 215 bp in the DRB1*14:24 and 14:37 and the DRB1*11:69, 11:82 and 13:09 alleles.

¹⁴Primer mix 24: Specific PCR fragment of 75 bp in the DRB1*14:26 and the DRB1*13:92 alleles. Specific PCR fragment of 125 bp in the DRB1*14:36, 14:41 and 14:77 and the DRB1*03:18, 03:43, 11:76, 13:34 and 13:64 and in the DRB3*01:14 alleles. Specific PCR fragment of 125 bp in the DRB1*14:36, 14:41 and 14:77 and the DRB1*03:18, 03:43, 11:76, 13:34 and 13:64 and in the DRB3*01:14 alleles. Specific PCR fragment of 165 bp in the DRB1*14:90 allele.

¹⁵Primer mix 25: Specific PCR fragment of 120 bp in the DRB1*14:07:01-14:07:02, 14:22, 14:25, 14:49, 14:53, 14:68-14:69 and 14:93 and the DRB1*01:14, 04:62, 04:69, 08:08, 08:15 and 13:45 and in the DRB3*02:16 alleles. Specific PCR fragment of 210 bp in the DRB1*14:56 allele. Specific PCR fragment of 250 bp in the DRB1*14:44:01-14:44:02 and the DRB1*03:35 alleles.

¹⁶Primer mix 28: Specific PCR fragment of 160 bp in the DRB1*14:88 allele. Specific PCR fragment of 230 bp in the DRB1*14:38, 14:47, 14:50 and 14:98 and the DRB1*03:01:02, 03:02:02, 03:05:03, 03:11:02, 03:13:02, 03:17, 03:24, 03:27, 03:35, 11:27:01, 11:84, 12:22, 13:33:02-13:33:03 and 13:61:01 and in the DRB3*01:14 alleles.

¹⁷Primer mix 29: Specific PCR fragment of 125 bp in the DRB1*14:60 and 14:97 and the DRB1*03:26, 11:44, 11:49-11:50 and 11:85 and 13:106 alleles. Specific PCR fragment of 175 bp in the DRB1*14:48 and the DRB1*13:31, 13:46, 13:54, 13:77 and 13:100 alleles. Specific PCR fragment of 220 bp in the DRB1*14:104 and the DRB1*03:14-03:15, 03:26, alleles. Specific PCR fragment of 125 and 220 bp in the DRB1*03:33 and 03:44 alleles. Specific PCR fragment of 175 and 220 bp in the DRB1*03:38 and in the DRB3*01:14 alleles.

¹⁸Primer mix 32: Specific PCR fragment of 100 bp in the DRB1*14:13, 14:63, 14:78 and 14:85 and the DRB1*03:12, 13:32, 13:65 and 13:93 alleles. Specific PCR fragment of 145 bp in the DRB1*14:19, 14:21 and 14:109, and the DRB1*03:12, 13:10 and 13:85 alleles.

¹⁹Primer mix 39: Specific PCR fragment of 120 bp in the DRB1*14:48, 14:108 and 14:109 and the DRB1*03:13:01-03:13:02, 03:38, 13:39, 03:58 and 13:77-13:79 and in the DRB3*01:08 alleles. Specific PCR fragment of 155 bp in the DRB1*14:18, 14:33, 14:51, 14:59, 14:95 and 14:106 and the DRB1*03:11:01 alleles. Specific PCR fragment of 120 and 155 bp in the DRB1*14:64 allele.

²⁰Primer mix 40: Specific PCR fragment of 215 bp in the DRB1*14:107 allele. Specific PCR fragment of 250 bp in the DRB1*14:71 allele.

²¹Primer mix 41: Specific PCR fragment of 115 bp in the DRB1*14:91, 14:94 and 14:97 and the DRB1*03:04:01, 03:26, 03:33, 03:44, 11:29, 11:44, 11:47, 11:49:01-11:50, 11:63, 11:85, 13:60, 13:84 and 13:106 alleles. Specific PCR fragment of 165 bp in the DRB1*14:90 allele. Specific PCR fragment of 245 bp in the DRB1*14:75 and 14:103 alleles.

²²Primer mix 43: Specific PCR fragment of 95 bp in the DRB1*14:101 allele. Specific PCR fragment of 200 bp in the DRB1*14:82 and 14:95 alleles.

²³Primer mix 46: Specific PCR fragment of 105 bp in the DRB1*14:92N allele. Specific PCR fragment of 165 bp in the DRB1*14:88 allele. Specific PCR fragment of 220 bp in the DRB1*14:87 and 14:89 alleles.

²⁴Primer mix 48: Specific PCR fragment of 65 bp in the DRB1*14:98 and the DRB1*11:27:01, 11:84, 12:22, 13:33:02-13:33:03 and 13:61:01 alleles. Specific PCR fragment of 190 bp in the DRB1*14:45 allele. Specific PCR fragment of 225 bp in the DRB1*03:35 allele.

'w', might be weakly amplified.

INTERPRETATION TABLE

DRB1*14 SSP subtyping

Amplification patterns of the DRB1*14:01 to DRB1*14:109 alleles

	Well ⁵																							
	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.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		170			130						160	215			125
Length of int. pos. control ¹	515	430	430	430	430	515	430	430	430	430	430	515	430	515	430	430	430	430	430	430	215	160	110	215
5'-primer(s) ²	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)	5'-AgA ^{3'} 37(196)	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)	5'-ggg ^{3'} 13(125)	5'-CAA ^{3'} 16(135)	5'-ACC ^{3'} 11(118)	5'-gTT ^{3'} 16(133)	5'-gTC ^{3'} 13(125)	5'-Cag ^{3'} 34(189)	5'-AgA ^{3'} 37(196)	5'-AgA ^{3'} 37(196)	5'-gAT ^{3'} 57(258)	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)	5'-gTT ^{3'} 37(197)	5'-gTT ^{3'} 16(133)	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)	5'-gTC ^{3'} 13(125)
3'-primer(s) ³	5'-TCC ^{3'} 70(296)	5'-CAG ^{3'} 57(257)	5'-CTg ^{3'} 70(295)	5'-CTC ^{3'} 28(171)	5'-CAC ^{3'} 86(344)	5'-CCA ^{3'} 86(344)	5'-CAG ^{3'} 74(307)	5'-CAG ^{3'} 57(257)	5'-CCA ^{3'} 86(344)	5'-CAG ^{3'} 57(257)	5'-CCT ^{3'} 58(260)	5'-CCT ^{3'} 74(308)	5'-gtg ^{3'} 60(265)	5'-gAA ^{3'} 67(286)	5'-CAG ^{3'} 85(341)	5'-CAA ^{3'} 78(321)	5'-CTT ^{3'} 71(298)	5'-CTg ^{3'} 28(171)	5'-CTC ^{3'} 71(298)	5'-Cag ^{3'} 57(257)	5'-gCT ^{3'} 57(256)	5'-ggT ^{3'} 47(227)	5'-gga ^{3'} 47(227)	5'-ACT ^{3'} 25(161)
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.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		170			130						215	160	110	215	125
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
DRB1 allele ⁴																								
*14:01:01-14:01:03	1	2				6						12	13					18				22		
*14:02			3	4	5																		22	
*14:03:01-14:03:02				4	5		7																22	
*14:04								8					13							20				
*14:05:01-14:05:02	1					6			9			12				16		18				22		
*14:05:03	1					6			9			12						18				22		
*14:06:01-14:06:02			3	4		6																22		
*14:07:01-14:07:02	1	2			5							12	13					18				22		
*14:08	1				6							12	13			16		18				22		
*14:09			3		5													18				22		
*14:10										10			13											
*14:11											11					16								
*14:12:01-14:12:02				4		6	7																22	
*14:13			3	4	5																	21	22	
*14:14	1				5							12				16		18				22		
*14:15																			19	20				
*14:16		2				6					11		13					18	19			22		
*14:17			3			6												18					23	
*14:18	1			4		6						12				16						22		
*14:19			3	4	5													17				22		
*14:20				4		6																22		
*14:21			3			6												17	18				23	
*14:22		2			5						11		13	14				18				22		
*14:23:01-14:23:03	1				6							12				16		18				22		
*14:24				4	5																	21	22	
*14:25		2			5						11			14				18		20		22		
*14:26	1	2				6						12	13					18				22		24
*14:27				4	5		7							14								22		
*14:28								8					13		15					20				
*14:29			3	4		6									15							22		
*14:30			3		5													18					23	
*14:31								8			11		13							20				
*14:32:01-14:32:02	1	2				6					11		13					18				22		
*14:33			3			6						12						18					23	
*14:34	1					6					11		13			16		18				22		
*14:35	1	2				6						12	13					18					23	
*14:36	1				5							12				16		18				22		24
*14:37						6			9									18			21	22		
*14:38	1	2				6						12	13					18				22		
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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120	250	220	160	125	190	80	100	175	205	250	130	175	215	120	215	115	225	95	215	125	105	60	65	Length of spec.	PCR product(s)	
250	210		230	175			145							155	250	245	165	200			220	165	105	190	Well No.	DRB1 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			
	26							33																	*14:01:01-14:01:03	
																									*14:02	
																									*14:03:01-14:03:02	
									34	35															*14:04	
																									*14:05:01-14:05:02	
																									*14:05:03	
					30																				*14:06:01-14:06:02	
25								33																	*14:07:01-14:07:02	
								33																	*14:08	
																									*14:09	
																									*14:10	
									34	35															*14:11	
					30																				*14:12:01-14:12:02	
							32																		*14:13	
																									*14:14	
										35															*14:15	
								33																	*14:16	
					30																				*14:17	
					30									39											*14:18	
							32																		*14:19	
					30																				*14:20	
							32																		*14:21	
25								33																	*14:22	
																									*14:23:01-14:23:03	
																									*14:24	
25								33																	*14:25	
								33																	*14:26	
																									*14:27	
									34	35															*14:28	
					30																				*14:29	
																									*14:30	
									34	35															*14:31	
								33																	*14:32:01-14:32:02	
					30									39											*14:33	
								33																	*14:34	
						31		33																	*14:35	
																									*14:36	
													38												*14:37	
				28				33																	*14:38	
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.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		170			130						160	215	215		125
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
DRB1 allele ⁴																								
*14:39	1	2			6				10	12	13						18				22			
*14:40				4	5		7											19			22			
*14:41				4	5																22		24	
*14:42	1				5						12					16	18					23		
*14:43	1				6				9		12					16	17	18			22			
*14:44:01	1				5						12					16	18				22			
*14:44:02	1				5						12						18				22			
*14:45	1				6				9		12					16	18				22			
*14:46			3																					
*14:47			3	4	5																	22		
*14:48			3	4	5																	22		
*14:49		2		4	5					11	13											22		
*14:50								8				13							20					
*14:51			3	4	5						12											22		
*14:52			3							11														
*14:53		2			5					11		14					18	20				23		
*14:54	1	2			6						12	13					18				22			
*14:55	w	2			6	7						13					18	19			22			
*14:56	1				6				9		12					16	18				22			
*14:57									10									19						
*14:58	1	2			6						12						18	20			22			
*14:59	1				6						12					16	18				22			
*14:60	1	2			6						12	13					18				22			
*14:61								8				13												
*14:62	1	2			6				9		12	13					18				22			
*14:63				4	5		7														21	22		
*14:64	1				6						12					16	18					23		
*14:65	1				6				9								18				21	23		
*14:67				4	5		7															22		
*14:68								8				13							20					
*14:69		2			5					11							18	20			22			
*14:70	1	2			6						12	13									22			
*14:71								8				13							20					
*14:72	1				6						12	13				16	18					23		
*14:73								8				13	14						20					
*14:74		2			6					11	13						18				22			
*14:75	1	2			6						12	13					18				22			
*14:76								8											20					
*14:77				4	5		7											19			22	24		
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.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		170			130						215	160	215		125
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
DRB1 allele ⁴																								
*14:78				4		6	7		9													21	22	
*14:79								8					13							20				
*14:80			3			6												18					22	
*14:81	1			4		6																	22	
*14:82	1	2				6						12	13					18					22	
*14:83			3	4		6																	22	
*14:84						6	7		9										18	19			22	
*14:85				4	5		7															21	22	
*14:86	1	2				6						12	13					18					22	
*14:87	1	2				6							13					18					22	
*14:88	1	2				6						12	13					18					22	
*14:89				4	5		7																22	
*14:90	1	2				6						12	13					18					22	24
*14:91	1					6			9			12				16		18					22	
*14:92N	1	2				6						12	13					18					22	
*14:93								8					13							20				
*14:94				4	5																		22	
*14:95	1					6						12				16		18					23	
*14:96	1					6			9			12				16		18					22	
*14:97	1	2				6						12	13					18					22	
*14:98				4	5																		22	
*14:99	1	2				6						12	13		15			18					22	
*14:100	1					6			9							16		18					22	
*14:101	1	2				6						12						18					22	
*14:102					5		7														20		22	
*14:103	1					6			9			12						18					22	
*14:104		2				6							13					18					22	
*14:105		2				6					11		13	14				18					22	
*14:106			3	4		6						12											22	
*14:107								8					13							20				
*14:108			3	4		6																	22	
*14:109			3	4	5													17					22	
*01:02:01-01:02:05, 01:23, 01:26, 01:34																16								
*01:14											11													
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.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		215 170			130						215 160	215			125
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
DRB1 allele ⁴																								
*03:01:01:01- 03:01:01:02, 03:01:03- 03:01:11, 03:07, 03:19, 03:22-03:23, 03:28, 03:32, 03:34, 03:36- 03:37, 03:39, 03:45- 03:48, 03:50-03:51, 03:54-03:56, 03:59, 13:01:07, 13:20, 13:71, 13:111						6												18					23	
*03:01:02						6												18					23	
*03:02:01				4	5																	22		
*03:02:02				4	5																	22		
*03:03				4	6																	22		
*03:04:01					6													18					23	
*03:05:01-03:05:02, 03:09, 03:40, 13:14:01- 13:14:03, 13:23:01- 13:23:02, 13:25, 13:29, 13:56, 13:62-13:63, 13:74, 13:82, 13:97					5													18					23	
*03:05:03					5													18					23	
*03:06					6													18				22		
*03:08, 11:40, 11:59					6													18					23	
*03:10		2			6								13					18					23	
*03:11:01					6							12						18					23	
*03:11:02, 03:24					6							12						18					23	
*03:12					6				9									18			21		23	
*03:13:01, 03:58, 13:78					6													18					23	
*03:13:02					6													18					23	
*03:14, 13:46, 13:100					5													18					23	
*03:15					6													18					23	
*03:16					6													18						
*03:17					5							12						18				22		
*03:18					6													18					23	24
*03:20					6										15			18					23	
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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120	250	220	160	125	190	80	100	175	205	250	130	175	215	120	215	115	225	95	215	125	105	60	65	Length of spec.
210	230	175	145	175	155	250	245	165	200	220	190	250	165	250	165	200	220	165	190	225	190	225	190	PCR product(s)
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.
																								DRB1 allele ⁴
																								*03:01:01:01- 03:01:01:02, 03:01:03- 03:01:11, 03:07, 03:19, 03:22-03:23, 03:28, 03:32, 03:34, 03:36- 03:37, 03:39, 03:45- 03:48, 03:50-03:51, 03:54-03:56, 03:59, 13:01:07, 13:20, 13:71, 13:111
			28		30																			*03:01:02
			28																					*03:02:01
																								*03:02:02
					30																			*03:03
																41								*03:04:01
																								*03:05:01-03:05:02, 03:09, 03:40, 13:14:01- 13:14:03, 13:23:01- 13:23:02, 13:25, 13:29, 13:56, 13:62-13:63, 13:74, 13:82, 13:97
			28																					*03:05:03
					30																			*03:06
					30							37												*03:08, 11:40, 11:59
					30	31		33																*03:10
					30									39										*03:11:01
			28		30																			*03:11:02, 03:24
					30		32																	*03:12
					30									39										*03:13:01, 03:58, 13:78
			28		30									39										*03:13:02
					29																			*03:14, 13:46, 13:100
					29	30																		*03:15
					30																			*03:16
			28																					*03:17
					30																			*03:18
					30																			*03:20
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.

Lot No.: **77M**

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Length of spec.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		170			130						160	215		145	125
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
DRB1 allele ⁴																								
*03:21, 03:25, 03:30, 03:49, 03:52, 13:11:01- 13:11:02, 13:22, 13:24, 13:44, 13:52, 13:68						6												18					23	
*03:26						6												18					22	
*03:27				4	5							12											22	
*03:29				4	5																			23
*03:31, 13:70						6												18					22	
*03:33						6												18						23
*03:35						5						12						18					22	
*03:38				4	5																		22	
*03:41, 13:07:01- 13:07:02						5												18					22	
*03:42, 15:32																								
*03:43						6												18					23	24
*03:44, 13:106						6												18						23
*03:53				4	5																			
*03:57																		18						23
*03:60						6																	22	
*04:10-04:11, 04:67, 04:91, 15:12										9														
*04:12										9														
*04:18, 04:86, 15:21																								
*04:62											10	11												
*04:69											10													
*08:01:01-08:02:03, 08:04:02-08:04:03, 08:07, 08:13, 08:16- 08:17, 08:26, 08:39, 08:42																							20	
*08:03:02, 08:14, 08:19, 08:23, 08:27, 08:30:01- 08:30:02, 08:32-08:34, 08:36-08:38																								20
*08:04:01, 08:04:04- 08:04:06, 08:28																								20
*08:05, 08:18, 08:24- 08:25, 08:40-08:41, 12:16											11													
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

Lot No.: **77M**

Lot-specific information

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Length of spec.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75	
PCR product(s)									250		170			130						160	215		145		125
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	
DRB1 allele ⁴																									
*08:06, 08:22									9											20					
*08:08								8					14							20					
*08:09, 08:21																			19	20					
*08:10, 08:12									9											20					
*08:11								w												20					
*08:15																				20					
*08:20						6	7											18	20			22			
*08:31, 12:01:01- 12:03:02, 12:06-12:08, 12:10-12:13, 12:17- 12:21, 12:23-12:26, 13:17											11														
*08:35																			19	20					
*11:01:01-11:01:04, 11:01:06, 11:01:08- 11:01:09, 11:01:11- 11:01:12, 11:08:01- 11:08:02, 11:10:01- 11:12:02, 11:14:01- 11:15, 11:19:01- 11:19:02, 11:24, 11:26, 11:27:02, 11:32-11:33, 11:39, 11:51, 11:61- 11:62, 11:66, 11:68, 11:74:01-11:75, 11:80- 11:81, 11:90-11:91, 11:94-11:95, 11:97, 11:99-11:101						5													18				23		
*11:01:05, 11:01:10						5										16		18					23		
*11:01:07						5												18							
*11:02:01-11:04:02, 11:04:04-11:04:07, 11:06:01, 11:07, 11:18, 11:21, 11:34-11:36, 11:38, 11:42-11:43, 11:46:01-11:46:02, 11:57, 11:60, 11:65:01- 11:65:02, 11:70, 11:77- 11:78, 11:98, 11:102						6													18				23		
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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120	250	220	160	125	190	80	100	175	205	250	130	175	215	120	215	115	225	95	215	125	105	60	65	Length of spec.
210			230	175			145							155	250	165		200			165	105	190	PCR product(s)
250				220												245						220	225	
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.
										35														DRB1 allele ⁴
25																								*08:06, 08:22
																								*08:08
																								*08:09, 08:21
										35												47		*08:10, 08:12
																								*08:11
25																						47		*08:15
																								*08:20
										35														*08:31, 12:01:01- 12:03:02, 12:06-12:08, 12:10-12:13, 12:17- 12:21, 12:23-12:26, 13:17
																						47		*08:35
																								*11:01:01-11:01:04, 11:01:06, 11:01:08- 11:01:09, 11:01:11- 11:01:12, 11:08:01- 11:08:02, 11:10:01- 11:12:02, 11:14:01- 11:15, 11:19:01- 11:19:02, 11:24, 11:26, 11:27:02, 11:32-11:33, 11:39, 11:51, 11:61- 11:62, 11:66, 11:68, 11:74:01-11:75, 11:80- 11:81, 11:90-11:91, 11:94-11:95, 11:97, 11:99-11:101
												37												*11:01:05, 11:01:10
												37												*11:01:07
												37												*11:02:01-11:04:02, 11:04:04-11:04:07, 11:06:01, 11:07, 11:18, 11:21, 11:34-11:36, 11:38, 11:42-11:43, 11:46:01-11:46:02, 11:57, 11:60, 11:65:01- 11:65:02, 11:70, 11:77- 11:78, 11:98, 11:102
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.

Lot No.: **77M**

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Length of spec.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		215	170			130					215	160	215		125
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
DRB1 allele ⁴																								
*11:04:03, 11:06:02					6											16		18						23
*11:09, 11:28:01-11:28:02, 11:87					5									14				18						23
*11:13:01-11:13:02	1					6										16		18						23
*11:16						6												18						23
*11:17	1					6						12				16		18				22		
*11:20					5													18						23
*11:23, 11:64					5		7											18		20				23
*11:25, 11:55						6	7											18		20				23
*11:27:01					5													18						23
*11:29					5													18						23
*11:31, 11:96					5													18						23
*11:37					5													18				22		
*11:41, 11:48, 11:56						6												18				22		
*11:44, 11:85						6												18						23
*11:45					5		7											18		20				23
*11:47, 11:63						6												18						23
*11:49:01					5													18						23
*11:50						6												18				22		
*11:52	1					6						12	13			16		18				22		
*11:53					5							12						18						23
*11:54:01						6						12				16		18						23
*11:54:02						6						12						18						23
*11:58:01						6								14				18						23
*11:58:02						6								14				18						23
*11:67											11									20				
*11:69, 11:82					5													18			21			23
*11:72					5																			23
*11:73, 11:79, 11:93					5												17	18						23
*11:76						6												18						23 24
*11:83						6								14				18				22		
*11:84						6												18						23
*11:86																		18						23
*11:88						6												18						
*11:89	1					6						12						18						23
*11:92						6																		23
*12:04, 12:09											11					16								
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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120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465	470	475	480	485	490	495	500	505	510	515	520	525	530	535	540	545	550	555	560	565	570	575	580	585	590	595	600	605	610	615	620	625	630	635	640	645	650	655	660	665	670	675	680	685	690	695	700	705	710	715	720	725	730	735	740	745	750	755	760	765	770	775	780	785	790	795	800	805	810	815	820	825	830	835	840	845	850	855	860	865	870	875	880	885	890	895	900	905	910	915	920	925	930	935	940	945	950	955	960	965	970	975	980	985	990	995	1000	1005	1010	1015	1020	1025	1030	1035	1040	1045	1050	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120	1125	1130	1135	1140	1145	1150	1155	1160	1165	1170	1175	1180	1185	1190	1195	1200	1205	1210	1215	1220	1225	1230	1235	1240	1245	1250	1255	1260	1265	1270	1275	1280	1285	1290	1295	1300	1305	1310	1315	1320	1325	1330	1335	1340	1345	1350	1355	1360	1365	1370	1375	1380	1385	1390	1395	1400	1405	1410	1415	1420	1425	1430	1435	1440	1445	1450	1455	1460	1465	1470	1475	1480	1485	1490	1495	1500	1505	1510	1515	1520	1525	1530	1535	1540	1545	1550	1555	1560	1565	1570	1575	1580	1585	1590	1595	1600	1605	1610	1615	1620	1625	1630	1635	1640	1645	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	1750	1755	1760	1765	1770	1775	1780	1785	1790	1795	1800	1805	1810	1815	1820	1825	1830	1835	1840	1845	1850	1855	1860	1865	1870	1875	1880	1885	1890	1895	1900	1905	1910	1915	1920	1925	1930	1935	1940	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070	2075	2080	2085	2090	2095	2100	2105	2110	2115	2120	2125	2130	2135	2140	2145	2150	2155	2160	2165	2170	2175	2180	2185	2190	2195	2200	2205	2210	2215	2220	2225	2230	2235	2240	2245	2250	2255	2260	2265	2270	2275	2280	2285	2290	2295	2300	2305	2310	2315	2320	2325	2330	2335	2340	2345	2350	2355	2360	2365	2370	2375	2380	2385	2390	2395	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2495	2500	2505	2510	2515	2520	2525	2530	2535	2540	2545	2550	2555	2560	2565	2570	2575	2580	2585	2590	2595	2600	2605	2610	2615	2620	2625	2630	2635	2640	2645	2650	2655	2660	2665	2670	2675	2680	2685	2690	2695	2700	2705	2710	2715	2720	2725	2730	2735	2740	2745	2750	2755	2760	2765	2770	2775	2780	2785	2790	2795	2800	2805	2810	2815	2820	2825	2830	2835	2840	2845	2850	2855	2860	2865	2870	2875	2880	2885	2890	2895	2900	2905	2910	2915	2920	2925	2930	2935	2940	2945	2950	2955	2960	2965	2970	2975	2980	2985	2990	2995	3000	3005	3010	3015	3020	3025	3030	3035	3040	3045	3050	3055	3060	3065	3070	3075	3080	3085	3090	3095	3100	3105	3110	3115	3120	3125	3130	3135	3140	3145	3150	3155	3160	3165	3170	3175	3180	3185	3190	3195	3200	3205	3210	3215	3220	3225	3230	3235	3240	3245	3250	3255	3260	3265	3270	3275	3280	3285	3290	3295	3300	3305	3310	3315	3320	3325	3330	3335	3340	3345	3350	3355	3360	3365	3370	3375	3380	3385	3390	3395	3400	3405	3410	3415	3420	3425	3430	3435	3440	3445	3450	3455	3460	3465	3470	3475	3480	3485	3490	3495	3500	3505	3510	3515	3520	3525	3530	3535	3540	3545	3550	3555	3560	3565	3570	3575	3580	3585	3590	3595	3600	3605	3610	3615	3620	3625	3630	3635	3640	3645	3650	3655	3660	3665	3670	3675	3680	3685	3690	3695	3700	3705	3710	3715	3720	3725	3730	3735	3740	3745	3750	3755	3760	3765	3770	3775	3780	3785	3790	3795	3800	3805	3810	3815	3820	3825	3830	3835	3840	3845	3850	3855	3860	3865	3870	3875	3880	3885	3890	3895	3900	3905	3910	3915	3920	3925	3930	3935	3940	3945	3950	3955	3960	3965	3970	3975	3980	3985	3990	3995	4000	4005	4010	4015	4020	4025	4030	4035	4040	4045	4050	4055	4060	4065	4070	4075	4080	4085	4090	4095	4100	4105	4110	4115	4120	4125	4130	4135	4140	4145	4150	4155	4160	4165	4170	4175	4180	4185	4190	4195	4200	4205	4210	4215	4220	4225	4230	4235	4240	4245	4250	4255	4260	4265	4270	4275	4280	4285	4290	4295	4300	4305	4310	4315	4320	4325	4330	4335	4340	4345	4350	4355	4360	4365	4370	4375	4380	4385	4390	4395	4400	4405	4410	4415	4420	4425	4430	4435	4440	4445	4450	4455	4460	4465	4470	4475	4480	4485	4490	4495	4500	4505	4510	4515	4520	4525	4530	4535	4540	4545	4550	4555	4560	4565	4570	4575	4580	4585	4590	4595	4600	4605	4610	4615	4620	4625	4630	4635	4640	4645	4650	4655	4660	4665	4670	4675	4680	4685	4690	4695	4700	4705	4710	4715	4720	4725	4730	4735	4740	4745	4750	4755	4760	4765	4770	4775	4780	4785	4790	4795	4800	4805	4810	4815	4820	4825	4830	4835	4840	4845	4850	4855	4860	4865	4870	4875	4880	4885	4890	4895	4900	4905	4910	4915	4920	4925	4930	4935	4940	4945	4950	4955	4960	4965	4970	4975	4980	4985	4990	4995	5000	5005	5010	5015	5020	5025	5030	5035	5040	5045	5050	5055	5060	5065	5070	5075	5080	5085	5090	5095	5100	5105	5110	5115	5120	5125	5130	5135	5140	5145	5150	5155	5160	5165	5170	5175	5180	5185	5190	5195	5200	5205	5210	5215	5220	5225	5230	5235	5240	5245	5250	5255	5260	5265	5270	5275	5280	5285	5290	5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Length of spec.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		215 170			130						215 160	215			125
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
DRB1 allele ⁴																								
*12:05, 12:14-12:15										11				15										
*12:22																								
*13:01:01-13:01:02, 13:01:04-13:01:06, 13:01:08, 13:06, 13:27- 13:28, 13:51, 13:59, 13:69, 13:87, 13:91, 13:98, 13:102, 13:105, 13:110, 13:112-13:113N						6												18					23	
*13:01:03						6										16		18						23
*13:02:01-13:02:03, 13:41, 13:73, 13:96:01, 13:99						5												18						23
*13:02:04, 13:16, 13:109																		18						23
*13:03:01-13:03:06, 13:33:01, 13:88, 13:90, 13:95						5											17	18			21	22		
*13:04, 13:75						6				9								18			21			23
*13:05:01-13:05:02, 13:50:01-13:50:02						5								14				18						23
*13:08						6												18	19			22		
*13:09						6												18			21			23
*13:10			3			6											17	18						23
*13:12:01-13:12:02, 13:38, 13:49						5												18			21	22		
*13:13						5	7											18	20		21	22		
*13:15				4		6																		23
*13:18						6	7							14				18						23
*13:19				4		6													19					22
*13:21:01-13:21:02, 13:30						5												18			21			23
*13:26				4		5								14										22
*13:31						5												18						23
*13:32						6				9								18			21	22		
*13:33:02-13:33:03						5											17	18			21	22		
*13:34						5												18						23 24
*13:35, 13:80						6												18						
*13:36						5												18				22		
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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120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465	470	475	480	485	490	495	500	505	510	515	520	525	530	535	540	545	550	555	560	565	570	575	580	585	590	595	600	605	610	615	620	625	630	635	640	645	650	655	660	665	670	675	680	685	690	695	700	705	710	715	720	725	730	735	740	745	750	755	760	765	770	775	780	785	790	795	800	805	810	815	820	825	830	835	840	845	850	855	860	865	870	875	880	885	890	895	900	905	910	915	920	925	930	935	940	945	950	955	960	965	970	975	980	985	990	995	1000	1005	1010	1015	1020	1025	1030	1035	1040	1045	1050	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120	1125	1130	1135	1140	1145	1150	1155	1160	1165	1170	1175	1180	1185	1190	1195	1200	1205	1210	1215	1220	1225	1230	1235	1240	1245	1250	1255	1260	1265	1270	1275	1280	1285	1290	1295	1300	1305	1310	1315	1320	1325	1330	1335	1340	1345	1350	1355	1360	1365	1370	1375	1380	1385	1390	1395	1400	1405	1410	1415	1420	1425	1430	1435	1440	1445	1450	1455	1460	1465	1470	1475	1480	1485	1490	1495	1500	1505	1510	1515	1520	1525	1530	1535	1540	1545	1550	1555	1560	1565	1570	1575	1580	1585	1590	1595	1600	1605	1610	1615	1620	1625	1630	1635	1640	1645	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	1750	1755	1760	1765	1770	1775	1780	1785	1790	1795	1800	1805	1810	1815	1820	1825	1830	1835	1840	1845	1850	1855	1860	1865	1870	1875	1880	1885	1890	1895	1900	1905	1910	1915	1920	1925	1930	1935	1940	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070	2075	2080	2085	2090	2095	2100	2105	2110	2115	2120	2125	2130	2135	2140	2145	2150	2155	2160	2165	2170	2175	2180	2185	2190	2195	2200	2205	2210	2215	2220	2225	2230	2235	2240	2245	2250	2255	2260	2265	2270	2275	2280	2285	2290	2295	2300	2305	2310	2315	2320	2325	2330	2335	2340	2345	2350	2355	2360	2365	2370	2375	2380	2385	2390	2395	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2495	2500	2505	2510	2515	2520	2525	2530	2535	2540	2545	2550	2555	2560	2565	2570	2575	2580	2585	2590	2595	2600	2605	2610	2615	2620	2625	2630	2635	2640	2645	2650	2655	2660	2665	2670	2675	2680	2685	2690	2695	2700	2705	2710	2715	2720	2725	2730	2735	2740	2745	2750	2755	2760	2765	2770	2775	2780	2785	2790	2795	2800	2805	2810	2815	2820	2825	2830	2835	2840	2845	2850	2855	2860	2865	2870	2875	2880	2885	2890	2895	2900	2905	2910	2915	2920	2925	2930	2935	2940	2945	2950	2955	2960	2965	2970	2975	2980	2985	2990	2995	3000	3005	3010	3015	3020	3025	3030	3035	3040	3045	3050	3055	3060	3065	3070	3075	3080	3085	3090	3095	3100	3105	3110	3115	3120	3125	3130	3135	3140	3145	3150	3155	3160	3165	3170	3175	3180	3185	3190	3195	3200	3205	3210	3215	3220	3225	3230	3235	3240	3245	3250	3255	3260	3265	3270	3275	3280	3285	3290	3295	3300	3305	3310	3315	3320	3325	3330	3335	3340	3345	3350	3355	3360	3365	3370	3375	3380	3385	3390	3395	3400	3405	3410	3415	3420	3425	3430	3435	3440	3445	3450	3455	3460	3465	3470	3475	3480	3485	3490	3495	3500	3505	3510	3515	3520	3525	3530	3535	3540	3545	3550	3555	3560	3565	3570	3575	3580	3585	3590	3595	3600	3605	3610	3615	3620	3625	3630	3635	3640	3645	3650	3655	3660	3665	3670	3675	3680	3685	3690	3695	3700	3705	3710	3715	3720	3725	3730	3735	3740	3745	3750	3755	3760	3765	3770	3775	3780	3785	3790	3795	3800	3805	3810	3815	3820	3825	3830	3835	3840	3845	3850	3855	3860	3865	3870	3875	3880	3885	3890	3895	3900	3905	3910	3915	3920	3925	3930	3935	3940	3945	3950	3955	3960	3965	3970	3975	3980	3985	3990	3995	4000	4005	4010	4015	4020	4025	4030	4035	4040	4045	4050	4055	4060	4065	4070	4075	4080	4085	4090	4095	4100	4105	4110	4115	4120	4125	4130	4135	4140	4145	4150	4155	4160	4165	4170	4175	4180	4185	4190	4195	4200	4205	4210	4215	4220	4225	4230	4235	4240	4245	4250	4255	4260	4265	4270	4275	4280	4285	4290	4295	4300	4305	4310	4315	4320	4325	4330	4335	4340	4345	4350	4355	4360	4365	4370	4375	4380	4385	4390	4395	4400	4405	4410	4415	4420	4425	4430	4435	4440	4445	4450	4455	4460	4465	4470	4475	4480	4485	4490	4495	4500	4505	4510	4515	4520	4525	4530	4535	4540	4545	4550	4555	4560	4565	4570	4575	4580	4585	4590	4595	4600	4605	4610	4615	4620	4625	4630	4635	4640	4645	4650	4655	4660	4665	4670	4675	4680	4685	4690	4695	4700	4705	4710	4715	4720	4725	4730	4735	4740	4745	4750	4755	4760	4765	4770	4775	4780	4785	4790	4795	4800	4805	4810	4815	4820	4825	4830	4835	4840	4845	4850	4855	4860	4865	4870	4875	4880	4885	4890	4895	4900	4905	4910	4915	4920	4925	4930	4935	4940	4945	4950	4955	4960	4965	4970	4975	4980	4985	4990	4995	5000	5005	5010	5015	5020	5025	5030	5035	5040	5045	5050	5055	5060	5065	5070	5075	5080	5085	5090	5095	5100	5105	5110	5115	5120	5125	5130	5135	5140	5145	5150	5155	5160	5165	5170	5175	5180	5185	5190	5195	5200	5205	5210	5215	5220	5225	5230	5235	5240	5245	5250	5255	5260	5265	5270	5275	5280	5285	5290	5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Length of spec.	210	175	140	85	260	260	225	170	130	175	85	225	115	60	185	105	220	85	145	110	170	145	145	75
PCR product(s)									250		170			130						215	160	215		125
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
DRB1 allele ⁴																								
*13:37					5												17	18				22		
*13:39					5													18					23	
*13:40						6												18				22		
*13:42						6							14					18					23	
*13:43		2				6					11		13					18					23	
*13:45		2				5					11							18	20				23	
*13:47					5		7											18	20			22		
*13:48, 13:58, 13:108						6			9									18				21	22	
*13:53				4		6																22		
*13:54						6												18					23	
*13:55					5		7											18	20		21	22		
*13:57				4		6													19				23	
*13:60					5													18				22		
*13:61:01						6												18					23	
*13:64						6												18	19				23	24
*13:65					5													18				21	22	
*13:66:01-13:66:02					5													17	18			21	23	
*13:67, 13:103																								
*13:72						6			9									18	19			22		
*13:76						6						12				16		18	19			22		
*13:77						6												18					23	
*13:79						6												18					23	
*13:81, 13:89, 13:94						6			9									17	18			21	22	
*13:83						6												18	19				23	
*13:84						6												18				22		
*13:85			3	4	5													17				22		
*13:86					5																		23	
*13:92						6												18					23	24
*13:93						6			9									18				21	23	
*13:101						5												17				21	22	
*13:104				4	5																		23	
*13:107					5													18	19				23	
*15:03:01:01- 15:03:01:02, 15:23																								
*16:08														14										
DRB3*01:08																								
DRB3*01:14					5													18				22	24	
DRB3*02:16																								
DRB1 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

Lot No.: **77M**

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120				125				130				135				140				145				150				155				160				165				170				175				180				185				190				195				200				205				210				215				220				225				230				235				240				245				250				255				260				265				270				275				280				285				290				295				300				305				310				315				320				325				330				335				340				345				350				355				360				365				370				375				380				385				390				395				400				405				410				415				420				425				430				435				440				445				450				455				460				465				470				475				480				485				490				495				500				505				510				515				520				525				530				535				540				545				550				555				560				565				570				575				580				585				590				595				600				605				610				615				620				625				630				635				640				645				650				655				660				665				670				675				680				685				690				695				700				705				710				715				720				725				730				735				740				745				750				755				760				765				770				775				780				785				790				795				800				805				810				815				820				825				830				835				840				845				850				855				860				865				870				875				880				885				890				895				900				905				910				915				920				925				930				935				940				945				950				955				960				965				970				975				980				985				990				995				1000			
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Lot No.: **77M**

Lot-specific information

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

Well number 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 DRB1*14 subtyping.

In addition, wells number 6, 12, 14, 21, 26, 27, 29, 31, 34, 36, 38, 42 and 44 to 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 and 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 and 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 DRB1*1466 allele has been renamed to DRB1*14:32:02

⁵Primer mix 9: Specific PCR fragment of 130 bp in the DRB1*14:62, 14:65 and 14:78 and the DRB1*03:12, 04:10-04:12, 04:67, 04:91, 08:06, 08:10, 08:12, 08:22, 13:04, 13:32, 13:48, 13:58, 13:75, 13:81, 13:89, 13:93-13:94, 13:108 and 15:122 alleles. Specific PCR fragment of 250 bp in the DRB1*14:05:01-14:05:03, 14:37, 14:43, 14:45, 14:56, 14:84, 14:91, 14:96, 14:100 and 14:103 and the DRB1*13:72 alleles.

Primer mix 11: Specific PCR fragment of 85 bp in the DRB1*14:16, 14:22, 14:25, 14:32:01-14:32:02, 14:34, 14:49, 14:53, 14:69, 14:74 and 14:105 and the DRB1*01:14, 04:62, 13:43 and 13:45 alleles. Specific PCR fragment of 170 bp in the DRB1*14:11 and the DRB1*11:67 alleles. Specific PCR fragment of 215 bp in the DRB1*14:52 and the DRB1*08:05, 08:18, 08:24-08:25, 08:40, 12:01:01-12:03:02, 12:05-12:21, 12:23-12:26 and 13:17 alleles. Specific PCR fragment of 85 and 215 bp in the DRB1*14:31 allele. Specific PCR fragment of 170 and 215 bp in the DRB1*08:31, 08:41 and 12:04 alleles.

Primer mix 14: Specific PCR fragment of 60 bp in the DRB1*14:22, 14:25, 14:53, 14:73 and 14:105 and the DRB1*08:08 alleles. Specific PCR fragment of 130 bp in the DRB1*14:27 and the DRB1*11:09, 11:28:01-11:28:02, 11:58:01-11:58:02, 11:83, 11:87, 13:05:01-13:05:02, 13:18, 13:26, 13:42, 13:50:01-13:50:02 and 16:08 alleles.

Primer mix 20: Specific PCR fragment of 110 bp in the DRB1*14:25, 14:53, 14:58 and 14:69 and the DRB1*13:45 alleles. Specific PCR fragment of 160 bp in the DRB1*14:04, 14:28, 14:31, 14:50, 14:68, 14:71, 14:73, 14:76, 14:79, 14:93, 14:102 and 14:107 and the DRB1*08:20, 11:23, 11:25, 11:45, 11:55, 11:64, 13:13, 13:47 and 13:55 alleles. Specific PCR fragment of 215 bp in the DRB1*14:15 and the DRB1*08:09, 08:21, 08:27, 08:32, 08:35 and 08:38 alleles. Specific PCR fragments of 160 and 215 bp in the DRB1*08:01:01-08:04:06, 08:06-08:07, 08:10-08:17, 08:19, 08:22-08:23, 08:26, 08:28, 08:30:01-08:30:02, 08:33-08:34, 08:36-08:37, 08:39, 08:42 and 11:67 alleles. Specific PCR fragments of 110, 160 and 215 bp in the DRB1*08:08 alleles. Not all specific PCR fragments may be obtained in alleles being amplified by more than one primer pair.

Primer mix 21: Specific PCR fragment of 170 bp in DRB1*14:13, 14:63, 14:65, 14:78 and 14:85 and the DRB1*03:12, 13:03:01-13:04, 13:12:01-13:13, 13:21:01-13:21:02, 13:30, 13:32-13:33:03, 13:38, 13:48-13:49, 13:55, 13:58, 13:65-13:66:02, 13:75, 13:81, 13:88-13:90, 13:93-13:95, 13:101 and 13:108 alleles. Specific PCR fragment of 215 bp in the DRB1*14:24 and 14:37 and the DRB1*11:69, 11:82 and 13:09 alleles.

Primer mix 24: Specific PCR fragment of 75 bp in the DRB1*14:26 and the DRB1*13:92 alleles. Specific PCR fragment of 125 bp in the DRB1*14:36, 14:41 and 14:77 and the DRB1*03:18, 03:43, 11:76, 13:34 and 13:64 and in the DRB3*01:14 alleles. Specific PCR fragment of 125 bp in the DRB1*14:36, 14:41 and 14:77 and the DRB1*03:18, 03:43, 11:76, 13:34 and 13:64 and in the DRB3*01:14 alleles. Specific PCR fragment of 165 bp in the DRB1*14:90 allele.

Primer mix 25: Specific PCR fragment of 120 bp in the DRB1*14:07:01-14:07:02, 14:22, 14:25, 14:49, 14:53, 14:68-14:69 and 14:93 and the DRB1*01:14, 04:62, 04:69, 08:08, 08:15 and 13:45 and in the DRB3*02:16 alleles. Specific PCR fragment of 210 bp in the DRB1*14:56 allele. Specific PCR fragment of 250 bp in the DRB1*14:44:01-14:44:02 and the DRB1*03:35 alleles.

Primer mix 28: Specific PCR fragment of 160 bp in the DRB1*14:88 allele. Specific PCR fragment of 230 bp in the DRB1*14:38, 14:47, 14:50 and 14:98 and the DRB1*03:01:02, 03:02:02, 03:05:03,

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03:11:02, 03:13:02, 03:17, 03:24, 03:27, 03:35, 11:27:01, 11:84, 12:22, 13:33:02-13:33:03 and 13:61:01 and in the DRB3*01:14 alleles.

Primer mix 29: Specific PCR fragment of 125 bp in the DRB1*14:60 and 14:97 and the DRB1*03:26, 11:44, 11:49-11:50 and 11:85 and 13:106 alleles. Specific PCR fragment of 175 bp in the DRB1*14:48 and the DRB1*13:31, 13:46, 13:54, 13:77 and 13:100 alleles. Specific PCR fragment of 220 bp in the DRB1*14:104 and the DRB1*03:14-03:15, 03:26, alleles. Specific PCR fragment of 125 and 220 bp in the DRB1*03:33 and 03:44 alleles. Specific PCR fragment of 175 and 220 bp in the DRB1*03:38 and in the DRB3*01:14 alleles.

Primer mix 32: Specific PCR fragment of 100 bp in the DRB1*14:13, 14:63, 14:78 and 14:85 and the DRB1*03:12, 13:32, 13:65 and 13:93 alleles. Specific PCR fragment of 145 bp in the DRB1*14:19, 14:21 and 14:109, and the DRB1*03:12, 13:10 and 13:85 alleles.

Primer mix 39: Specific PCR fragment of 120 bp in the DRB1*14:48, 14:108 and 14:109 and the DRB1*03:13:01-03:13:02, 03:38, 13:39, 03:58 and 13:77-13:79 and in the DRB3*01:08 alleles. Specific PCR fragment of 155 bp in the DRB1*14:18, 14:33, 14:51, 14:59, 14:95 and 14:106 and the DRB1*03:11:01 alleles. Specific PCR fragment of 120 and 155 bp in the DRB1*14:64 allele.

Primer mix 40: Specific PCR fragment of 215 bp in the DRB1*14:107 allele. Specific PCR fragment of 250 bp in the DRB1*14:71 allele.

Primer mix 41: Specific PCR fragment of 115 bp in the DRB1*14:91, 14:94 and 14:97 and the DRB1*03:04:01, 03:26, 03:33, 03:44, 11:29, 11:44, 11:47, 11:49:01-11:50, 11:63, 11:85, 13:60, 13:84 and 13:106 alleles. Specific PCR fragment of 165 bp in the DRB1*14:90 allele. Specific PCR fragment of 245 bp in the DRB1*14:75 and 14:103 alleles.

Primer mix 43: Specific PCR fragment of 95 bp in the DRB1*14:101 allele. Specific PCR fragment of 200 bp in the DRB1*14:82 and 14:95 alleles.

Primer mix 46: Specific PCR fragment of 105 bp in the DRB1*14:92N allele. Specific PCR fragment of 165 bp in the DRB1*14:88 allele. Specific PCR fragment of 220 bp in the DRB1*14:87 and 14:89 alleles.

Primer mix 48: Specific PCR fragment of 65 bp in the DRB1*14:98 and the DRB1*11:27:01, 11:84, 12:22, 13:33:02-13:33:03 and 13:61:01 alleles. Specific PCR fragment of 190 bp in the DRB1*14:45 allele. Specific PCR fragment of 225 bp in the DRB1*03:35 allele.

'w', might be weakly amplified.

CELL LINE VALIDATION SHEET																					
DRB1*14 SSP subtyping kit																					
					Well																
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
					Prod. No.:	201191401	201191402	201191403	201191404	201191405	201191406	201191407	201191408	201191409	201191410	201191411	201191412	201191413	201191414	201191415	201191416
	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	*14:54		+	+	-	-	+	+	-	-	-	-	-	+	+	-	-	-	-
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																			
DRB1*14 SSP subtyping kit																			
				Well															
				17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
				201191417	201191418	201191419	201191420	201191421	201191422	201191423	201191424	201191425	201191426	201191427	201191428	201191429	201191430	201191431	201191432
	IHWC cell line	DRB1	Prod. No.:																
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	*14:54	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	
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																			
DRB1*14 SSP subtyping kit																			
				Well															
				33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
				201191433	201191434	201191435	201191436	201191437	201191438	201191439	201191440	201191441	201191442	201191443	201191444	201191445	201191446	201191447	201191448
	IHWC cell line	DRB1	Prod. No.:																
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	*14:54	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
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		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CERTIFICATE OF ANALYSIS

Olerup SSP® DRB1*14 SSP

Product number: 101.117-12/03 – including *Taq* pol.
Lot number: 77M
Expiry date: 2014-May-01
Number of tests: 12 tests – Product No. 101.117-12
 3 tests – Product No. 101.117-03
Number of wells per test: 48

Well specifications:

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
1	2011-914-01	17	2011-914-17	33	2011-914-33
2	2011-914-02	18	2011-914-18	34	2011-914-34
3	2011-914-03	19	2011-914-19	35	2011-914-35
4	2011-914-04	20	2011-914-20	36	2011-914-36
5	2011-914-05	21	2011-914-21	37	2011-914-37
6	2011-914-06	22	2011-914-22	38	2011-914-38
7	2011-914-07	23	2011-914-23	39	2011-914-39
8	2011-914-08	24	2011-914-24	40	2011-914-40
9	2011-914-09	25	2011-914-25	41	2011-914-41
10	2011-914-10	26	2011-914-26	42	2011-914-42
11	2011-914-11	27	2011-914-27	43	2011-914-43
12	2011-914-12	28	2011-914-28	44	2011-914-44
13	2011-914-13	29	2011-914-29	45	2011-914-45
14	2011-914-14	30	2011-914-30	46	2011-914-46
15	2011-914-15	31	2011-914-31	47	2011-914-47
16	2011-914-16	32	2011-914-32	48	2011-914-48

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 10, 14, 15, 19, 24, 27 to 29, 31, 38 to 40, 42, 43, 45, 46 and 48 were available.

The specificities of the primers in primer solutions 10, 14, 15, 19, 24, 27 to 29, 31, 38, 39, 42, 43, 45 and 48 were tested by separately adding one or two additional 5'-primer, respectively, one or several additional 3'-primers.

In primer solutions 40 and 46 it was only possible to test the 5'-primers, the 3'-primers were not possible to test.

In primer solutions 10, 14, 43 and 44 one of the 5'-primers was not possible to test, and in primer solutions 17, 22, 24, 25, 28, 29, 37, 39, 41 and 48 one or more of the 3'-primers were not possible to test.

Additional primers in primer solutions 11, 12, 21, 25, 32, 36 and 41 were tested by separately adding one 5'-primer and/or one 3'-primer.

Lot No.: **77M**

Lot-specific information

www.olerup-ssp.com

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

Date of approval: 2011-December-15

Approved by:

Production Quality Control

Lot No.: **77M**

Lot-specific information

www.olerup-ssp.com

Declaration of Conformity

Product name: *Olerup* SSP® DRB1*14
Product number: 101.117-12/03
Lot number: 77M

Intended use: DRB1*14 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 II List B, conformity assessed using Annex IV, as transposed into the national laws of the Member States of the European Union.

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

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

Stockholm, Sweden
2012-January-09

Ann-Cathrin Jareman
Head of QA and Regulatory Affairs

Lot No.: **77M**

Lot-specific information

www.olerup-ssp.com

ADDRESSES:

Manufacturer:

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

Tel: +46-8-717 88 27

Fax: +46-8-717 88 18

E-mail: info-ssp@olerup.com

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

Distributed by:

Olerup GmbH, Löwengasse 47 / 6, AT-1030 Vienna, Austria.

Tel: +43-1-710 15 00

Fax: +43-1-710 15 00 10

E-mail: support-at@olerup.com

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

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

Tel: 1-877-OLERUP1

Fax: 610-344-7989

E-mail: info.us@olerup.com

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

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