

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

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

Product number:	101.708-24 – including <i>Taq</i> pol. 101.708-24u – without <i>Taq</i> pol.
Lot number:	0V9
Expiry date:	2029-03-01
Number of tests:	24 tests
Number of wells per test:	95 +1
Storage - pre-aliquoted primers:	dark, between -15°C and -25°C
- PCR Master Mix:	between -15°C and -25°C
- Adhesive PCR seals	RT

This Product Description is only valid for Lot No. 0V9.

Complete product documentation consists of generic Instructions for Use (IFU), lot specific Product Insert, Worksheet and Certificate.

CHANGES COMPARED TO THE PREVIOUS OLERUP SSP® HLA-A-B-DR-DQ COMBI TRAY LOT (9R3)

The **HLA-A low resolution** specificity and interpretation tables have been updated for the HLA-A alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ Combi Tray lot was made (**Lot No. 9R3**). The kit design is based on IMGT/HLA database 3.59.0.

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

Well	5'-primer	3'-primer	rationale
16	Modified	-	5'-primer modified for improved HLA-specific amplification.

The **HLA-B low resolution** specificity and interpretation tables have been updated for the HLA-B alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ Combi Tray lot was made (**Lot No. 9R3**). The kit design is based on IMGT/HLA database 3.59.0.

The B low primer set is unchanged compared to the previous lot (**Lot No. 9R3**).

The **HLA-DR low resolution** specificity and interpretation tables have been updated for the HLA-DRB alleles described since the previous *Olerup* SSP® HLA-



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Lot-specific information

A-B-DR-DQ Combi Tray lot was made (**Lot No. 9R3**). The kit design is based on IMGT/HLA database 3.59.0.

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

Well	5'-primer	3'-primer	rationale
70	Removed	-	5'-primer removed for decreased tendencies of primer oligomer formation.

The **DQ low resolution** specificity and interpretation tables have been updated for the HLA-DQB1 alleles described since the previous *Olerup* SSP[®] HLA-A-B-DR-DQ Combi Tray lot was made (**Lot No. 9R3**). The kit design is based on IMGT/HLA database 3.59.0.

The DQ low primer set is unchanged compared to the previous lot (**Lot No. 9R3**).



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Well **96** contains Negative Control primer pairs, that will amplify the majority of the Olerup SSP[®] HLA Class I, DRB, DQB1, DPB1 and DQA1 amplicons as well as all the amplicons generated by the control primer pairs matching the human growth hormone gene.

HLA-specific PCR product sizes range from 75 to 200 base pairs.
The PCR product generated by the positive control primer pair is 200 base pairs.

Length of PCR product	105	200	105	80	75	80	85
5'-primer¹	164	340	440	45	45	43	36
	5'-CAC ^{3'}	5'-Agg ^{3'}	5'-TTA ^{3'}	5'-Tgg ^{3'}	5'-Tgg ^{3'}	5'-Tgg ^{3'}	5'-TAC ^{3'}
							36
							5'-TAT ^{3'}
3'-primer²	231	2nd I	507	59	58	57	47
	5'-TgC ^{3'}	5'-AAA ^{3'}	5'-TTg ^{3'}	5'-CTC ^{3'}	5'-ggC ^{3'}	5'-CTC ^{3'}	5'-ACA ^{3'}
							48
							5'-gCA ^{3'}
							48
							5'-gCC ^{3'}
							52
							5'-TgT ^{3'}
A*	+	+	+				
B*	+	+	+				
C*	+	+	+				
DRB1				+	+		
DRB3				+	+		
DRB5				+			
DQB1					+		
DPB1						+	
DQA1							+

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

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



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Lot-specific information

PRODUCT DESCRIPTION

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

CONTENT

The primer set contains 5'- and 3'-primers for grouping the HLA-A*01:01 to A*80:10 alleles into the corresponding serological groups A1 to A80.

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

The primer set contains 5'- and 3'-primers for grouping the DRB1*01:01 to DRB1*10:46 alleles into the corresponding serological groups DR1 to DR18 as well as primer pairs for recognizing the DRB3, DRB4 and DRB5 groups of alleles.

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

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

PLATE LAYOUT

Each test consists of 96 PCR reactions in a 96 well PCR plate.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	NC

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

Well No. 1 is marked with the Lot No. '0V9'.

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

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

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

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

Well 96 – Negative Control.

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.



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Lot-specific information

INTERPRETATION

Only HLA-A alleles will be amplified by the 21 wells of the HLA-A low resolution primer set, **wells 1 to 21**, except that a few HLA-B and HLA-C alleles will be amplified by some primer mixes. For further details see Specificity Table.

Only HLA-B alleles will be amplified by the 43 wells of the HLA-B low resolution, primer set, **wells 22 to 64**, except that a few HLA-A and HLA-C alleles will be amplified by some primer mixes. For further details see Specificity Table.

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

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

UNIQUELY IDENTIFIED ALLELES

All the HLA-A alleles, i.e. **A*01:01 to A*80:10**, recognized by the HLA Nomenclature Committee in January 2025^{1,2} will be amplified by the primers in the HLA-A low resolution primer set, **wells 1 to 21**. The HLA-A alleles will be grouped into their corresponding serological specificities^{3,4,5}.

All the HLA-B alleles, i.e. **B*07:02 to B*83:01**, recognized by the HLA Nomenclature Committee in January 2025^{1,2} will be amplified by the primers in the HLA-B low resolution primer set, **wells 22 to 64**. The HLA-B alleles will be grouped into their corresponding serological specificities³.

Notes on Bw assignment

The Bw4 and Bw6 status of HLA-B alleles is based their serological type:

	Serological Type
Bw4	B5, B5102, B5103, B13, B17, B27, B37, B38(16), B44(12), B47, B49(21), B51(5), B52(5), B53, B57(17), B58(17), B59, B63(15), B77(15)
Bw6	B7, B703, B8, B14, B18, B22, B2708, B35, B39(16), B3901, B3902, B40, B4005, B41, B42, B45(12), B46, B48, B50(21), B54(22), B55(22), B56(22), B60(40), B61(40), B62(15), B64(14), B65(14), B67, B70, B71(70), B72(70), B73, B75(15), B76(15), B78, B81, B82

However, according to the HLA Dictionary⁸ there are several exceptions to these associations. This product contains reactions specific to the sequences that code for the Bw4 and Bw6 epitopes. A small number of alleles classified as Bw4 or Bw6 in the HLA Dictionary are not amplified neither by the Bw4 nor the Bw6 primer mix:

Bw Reactivity	Allele
Bw6	B*15:377Q, B*35:01:39, B*35:02:09, B*39:01:15



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All the HLA-DRB1, -DRB3, -DRB4 and -DRB5 alleles, i.e. **DRB1*01:01:01:01 to DRB1*10:46, DRB3*01:01:02:01 to DRB3*03:78, DRB4*01:01:01:01 to DRB4*03:01N, DRB5*01:01:01:01 to DRB5*02:39**, recognized by the HLA Nomenclature Committee in January 2025^{1,2,6} will be amplified by the primers in the DR low resolution primer set, **wells 65 to 87**. The HLA-DRB alleles will be grouped into their corresponding serological specificities³.

All the DQB1 alleles, i.e. **DQB1*05:01:01:01 to DQB1*05:357, DQB1*06:01:01:01 to DQB1*06:525, DQB1*02:01:01:01 to DQB1*02:245, DQB1*03:01:01:01 to DQB1*03:572 and DQB1*04:01:01:01 to DQB1*04:104**, recognized by the HLA Nomenclature Committee in January 2025^{1,2} will be amplified by the primers in the DQ low resolution primer set. The DQB1 alleles will be grouped into their corresponding serological specificities⁷, i.e.:

DQ5(1) =	DQB1*05:01:01-05:05
DQ6(1) =	DQB1*06:01:01-06:33
DQ2 =	DQB1*02:01:01-02:05
DQ3 =	DQB1*03:06, 03:10, 03:14
DQ7(3) =	DQB1*03:01:01-03:01:06, 03:04, 03:09, 03:13, 03:16, 03:19
DQ8(3) =	DQB1*03:02:01-03:02:05, 03:05:01-03:05:04, 03:07-03:08, 03:11, 03:18
DQ9(3) =	DQB1*03:03:02:01-03:03:04, 03:12, 03:15, 03:17, 03:20
DQ4 =	DQB1*04:01-04:02

¹HLA-A, HLA-B, HLA-DRB and HLA-DQB1 alleles listed on the IMGT/HLA web page 2025-January-15, release 3.59.0, www.ebi.ac.uk/imgt/hla.

²Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

³The HLA-A, HLA-B, HLA-C, HLA-DRB1, -DRB3, -DRB4 and -DRB5 and the DQB1 alleles will be grouped into their corresponding serological specificities, except that following alleles give rise to identical amplification patterns:



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Lot-specific information

HLA-A

Alleles	Alleles
A*01:26, 01:136, 01:192, 01:380:01:01-01:380:01:02, A*11:94, 11:112, 11:211, 11:226, 11:290, 11:326	A*23:11N, A*31:29, 31:85
A*01:28, 01:229, 01:299, A*11:282	A*23:14:01-23:14:02, 23:104-23:105, 23:141, A*24:24, 24:71, 24:315, 24:392, 24:527, 24:569
A*01:43, A*11:271	A*25:78, A*26:57, A*66:12, 66:15
A*11:116, 11:140, 11:199:01-11:199:02, 11:222, A*66:234	A*26:92, A*66:42
A*03:01:23, 03:01:83, 03:01:94, 03:08:01:01-03:08:01:02, 03:36N, 03:57, 03:59, 03:72, 03:89:02, 03:107-03:108, 03:111, 03:142, 03:172-03:173, 03:176, 03:178N, 03:198-03:199, 03:203, 03:205, 03:211, 03:252, 03:267, 03:330N, 03:398, 03:413, 03:463N, 03:498, A*24:92, 24:458, 24:551, 24:557	A*30:01:01:01-30:04:04, 30:06-30:07, 30:09:01:01-30:12:02, 30:14L-30:15, 30:17-30:20, 30:23-30:43, 30:45, 30:47-30:54, 30:56-30:88, 30:90-30:124, 30:126-30:139, 30:141-30:149, 30:151-30:162, 30:164-30:176, 30:178N-30:185, 30:187-30:237, B*07:260, C*12:328
A*03:187, 03:215, 03:225, 03:249, 03:322, 03:414, 03:468, A*25:46, 25:77, 25:81-25:82, 25:89	A*31:08, 31:109, A*33:53, 33:125, 33:131, 33:249
A*11:01:01:01-11:02:08, 11:04-11:07:01, 11:08-11:09, 11:12:01-11:16, 11:18-11:19, 11:21N-11:24:02, 11:26-11:27, 11:29-11:39, 11:41-11:52Q, 11:54:01-11:59, 11:61-11:93, 11:95-11:111, 11:114-11:115N, 11:117-11:129, 11:131-11:138, 11:141-11:157, 11:159-11:161, 11:163-11:174, 11:176-11:182Q, 11:184-11:190, 11:192-11:198, 11:200-11:208:02N, 11:210N, 11:212-11:221, 11:224-11:225, 11:227-11:268, 11:270, 11:272Q-11:281, 11:283-11:289, 11:291-11:305, 11:307-11:325, 11:327-11:347N, 11:349-11:365N, 11:367-11:371, 11:373-11:380, 11:382N-11:439, 11:441-11:477, 11:479N-11:486, A*24:555	A*32:03:01:01-32:03:01:02, 32:38, 32:60, 32:71, 32:78, 32:80, 32:107, B*15:642
A*11:11, A*34:19	A*34:01:01:01-34:01:07, 34:05-34:06, 34:11-34:12, 34:14, 34:16-34:18, 34:23, 34:27, 34:31, A*66:40
A*11:116, 11:140, 11:199:01-11:199:02, 11:222, A*66:23	A*34:34, A*66:02:01:01-66:03:01:03, 66:16, 66:21, 66:25-66:26Q, 66:28N, 66:34, 66:39N, 66:43, 66:48
A*23:01:01:01-23:10:02, 23:12-23:13, 23:15-23:56, 23:58-23:63, 23:65, 23:67-23:68, 23:70-23:98, 23:100-23:103N, 23:106N-23:112, 23:114-23:127, 23:129-23:136, 23:138-23:140, 23:142N-23:149, B*18:27	



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HLA-B

Alleles	Alleles
B*07:04:01-07:04:02, 07:25, 07:146, B*42:39	B*51:01:107, 51:118N, 51:147, 51:267, 51:284, B*52:73, B*58:08:01-58:08:02
B*07:174, 07:202, 07:222, 07:279, B*81:02:01-81:02:02	B*51:42, 51:359, 53:62
B*07:209, 07:271, 07:489, 81:11	B*51:45, 51:81, 51:352, B*53:44, 53:47, 53:78
B*07:349, B*42:05:01-42:05:02	B*51:310, B*52:88, B*53:28
B*08:26:01-08:26:02, 08:50, 08:62, 08:85, 08:94, 08:242, 08:263, 08:265, 08:272, 08:299, 08:324, B*42:01:07, 42:07, 42:24, 42:26	B*53:30, B*58:111
B*13:04, 13:10, 13:35, 13:59, 13:71-13:72, 13:108, 13:127, 13:140, 13:160, B*44:135, 44:158, 44:184	B*53:39, B*57:128, B*58:100
B*14:08:01-14:08:02, 14:55, B*39:01:35, 39:30, 39:32-39:33, 39:43, 39:47, 39:50, 39:74, 39:82, 39:102, 39:107, 39:112, 39:128, 39:136, 39:169, 39:171, 39:174	B*54:49N, B*55:01:07, 55:02:01:01-55:02:10, 55:02:12-55:02:16, 55:07, 55:10, 55:12-55:13, 55:16, 55:19, 55:23, 55:26-55:27, 55:30, 55:32, 55:35, 55:37, 55:39, 55:41-55:43, 55:46-55:48, 55:50, 55:57, 55:61-55:63, 55:65, 55:67, 55:69-55:72, 55:77, 55:80-55:83N, 55:88-55:89N, 55:96, 55:107, 55:112, 55:117N, 55:120, 55:128-55:129, 55:131-55:133, 55:137-55:138, 55:140, 55:142, B*56:10, 56:66
B*15:116, 15:352, B*40:21	B*55:04, 55:08, 55:49, 55:86, 56:01:05, 56:01:13, 56:15, 56:18-56:19N, 56:22, 56:31-56:32, 56:50, 56:88, 56:99
B*15:712, B*58:01:03, 58:01:16, 58:16:01-58:16:02, 58:26-58:27, 58:46, 58:61, 58:121-58:122, 58:127	B*56:13, B*82:04
B*18:29, 18:72:01-18:72:03, 18:92, 18:175, B*35:01:55, 35:01:62, 35:03:44, 35:31:01:01-35:32:03, 35:37, 35:53N, 35:64:01-35:64:02, 35:68:01-35:68:02, 35:75, 35:99, 35:118-35:119, 35:127, 35:151:01-35:151:02, 35:174, 35:205:01-35:205:03, 35:234-35:235, 35:251:02, 35:273, 35:292, 35:367:01-35:367:02, 35:369, 35:409, 35:433, 35:521, 35:523, 35:535, 35:578-35:579, 35:611	B*57:01:01:01-57:01:04, 57:01:06-57:01:22, 57:01:24-57:01:31, 57:01:33-57:01:44, 57:01:46-57:03:09, 57:05-57:06, 57:08, 57:10, 57:15-57:20, 57:22-57:23, 57:25, 57:27-57:30, 57:32-57:35, 57:37-57:44, 57:46, 57:48-57:50, 57:52-57:58, 57:60-57:68, 57:70, 57:72-57:81, 57:84-57:87, 57:90-57:92, 57:94-57:108, 57:110-57:117, 57:120-57:127, 57:129-57:144, 57:146, 57:148-57:160, 57:162N-57:174, 57:176-57:191, B*58:36
B*35:01:56, 35:191, 35:620, B*58:64	B*57:01:23, 57:01:45, 57:36, 57:89, 57:109, B*58:01:01:01-58:01:02, 58:01:04-58:01:15, 58:01:17-58:01:51, 58:04-58:05, 58:10N-58:15, 58:19, 58:21-58:24, 58:28:01-58:29, 58:31N-58:35, 58:37, 58:39N-58:42, 58:45:01-58:45:02, 58:47-58:59:02, 58:62-58:63, 58:65-58:72N, 58:74-58:75:02, 58:77, 58:79-58:83, 58:85-58:93N, 58:95-58:99, 58:101-58:103, 58:105-58:107, 58:109-58:110, 58:112-58:113, 58:115-58:120, 58:123-58:126, 58:129-58:131:02, 58:133N-58:136, 58:138-58:145, 58:147, 58:149, 58:152-58:159
B*35:63, 35:317, B*40:129	B*57:04:02, B*58:114
B*40:496, B*41:62	



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Lot-specific information

HLA-DR

Alleles

DRB1*03:126, DRB1*13:193
DRB1*03:218N, DRB1*13:176
DRB1*08:09:02, DRB1*14:15
DRB1*08:20, 08:129, DRB1*13:18, 13:47, 13:55, 13:158:01-13:158:02,
13:164, 13:232, 13:286, 13:340
DRB1*08:31, DRB1*11:05, 11:209, 11:309
DRB1*08:41, 08:75, DRB1*11:67, 11:193:01-11:193:02
DRB1*08:57, 08:80, 08:98, DRB1*13:248
DRB1*11:264, DRB1*13:05:01:01-13:05:03, 13:07:01-13:07:02, 13:11:01-
13:11:02, 13:14:01-13:14:03, 13:21:01:01-13:21:02, 13:42:01-13:42:02, 13:46,
13:49:01-13:50:03, 13:62, 13:100, 13:108, 13:132, 13:136, 13:150, 13:169,
13:189, 13:199, 13:203, 13:229, 13:246, 13:284, 13:302, 13:349, 13:352
DRB1*11:293, DRB1*13:45
DRB1*11:339, DRB1*13:67, 13:103, 13:160, 13:195
DRB1*12:57, DRB3*02:111
DRB1*12:73, DRB1*13:366
DRB1*13:13, 13:119, 13:154, 13:156, DRB1*14:84, 14:116, 14:144
DRB1*13:44, 13:86, 13:206, DRB1*14:183
DRB1*13:235, DRB1*14:98
DRB1*13:314, DRB1*14:37

HLA-DQ

Alleles

DQB1*03:132, DQB1*04:75
DQB1*05:01:01:01-05:01:50, 05:01:52-05:43:01, 05:44-05:61, 05:63-05:343,
05:345-05:357, DRB1*06:325
DQB1*05:01:51, 05:62, DRB1*06:23, 06:156, 06:162, 06:169, 06:342, 06:389
DQB1*05:344, DQB1*06:01:01:01-06:02:42, 06:02:44-06:03:09, 06:03:11-
06:03:32, 06:03:34-06:05:01, 06:06-06:22:03, 06:24-06:28, 06:30-06:50,
06:51:02-06:65, 06:67-06:95, 06:96:02-06:118:03, 06:119-06:122, 06:124-
06:138, 06:140-06:155, 06:157-06:161, 06:163-06:167, 06:170-06:171,
06:173-06:208:02, 06:210-06:219, 06:221-06:321, 06:322:03-06:324, 06:326-
06:336, 06:338-06:341N, 06:343-06:376, 06:378-06:388, 06:390-06:474,
06:476-06:523, 06:525

⁴The A*36 alleles will give rise to identical amplification patterns as some A*01 alleles. These alleles can be separated by the A*01 and A*36 high resolution SSP primer sets.

⁵The primers in this kit do not amplify the A*23:66, 23:99, 23:128, 23:137, A*24:14:01:01-24:15, 24:51-24:53, 24:57, 24:64, 24:94, 24:114, 24:138, 24:188, 24:222N, 24:228, 24:291, 24:296, 24:304, 24:316, 24:324, 24:412, 24:481, 24:515, 24:574 and 24:610 alleles. These alleles can be amplified by the HLA-A low resolution kit and the A-B-DR kit.

⁶The primers in this kit do not amplify the A*31:234 allele, the DRB1*04:382, DRB1*13:299, and DRB5*01:131N alleles or the DQB1*02:218 and DQB1*02:234 alleles.

⁷The serological split of the DQB1*05:05-05:357, DQB1*06:06 to 06:07, DQB1*06:10, 06:13, 06:15-06:24 and 06:27 to 06:525, DQB1*02:04-02:245, DQB1*03:07-03:09, 03:11-03:572 and the DQB1*04:03:01-04:104 alleles is not known. In this table we have used the expert-assigned serological grouping in Tissue Antigens (2009) 73:95-170, and also inferred the serological grouping from the naming of the sequence-defined allele.

⁸Holdsworth, R Hurley, C K Marsh, S G E Lau, M Noreen, H J Kempenich, J H Setterholm, M Maiers, M: 'The HLA dictionary 2008 : a summary of HLA-A , -B , -C , -DRB1 / 3 / 4 / 5 , and -



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Lot-specific information

DQB1 alleles and their association with serologically defined HLA-A, -B, -C, -DR and -DQ antigens', Tissue Antigens, 2009, 73(2), pp. 95-170.



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SPECIFICITY TABLE

HLA-A low resolution primer set

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

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	HLA-A serology ³	Amplified HLA-A alleles ^{4,5}
1⁶	120 bp, 145 bp, 225 bp	800 bp	A1, A36	*01:01:01:01-01:04:01:02N, 01:06-01:33, 01:35-01:478, 03:18, 03:135, 03:395, 11:94, 11:112, 11:211, 11:226, 11:271, 11:282, 11:290, 11:326, 25:59, 26:120, 31:200, 32:156, 36:01:01:01-36:15
2	135 bp, 175 bp, 215 bp, 255 bp, 365 bp, 415 bp	800 bp	A2, A19, A28, A203, A210,	*02:01:01:01-02:01:07, 02:01:09-02:01:15, 02:01:17-02:01:19, 02:01:21-02:01:81, 02:01:83-02:22:02, 02:24:01-02:35:01, 02:35:03-02:47, 02:49:01-02:77, 02:78 ^w , 02:79:01-02:97:02, 02:99:01-02:99:02, 02:101:01-02:128, 02:130-02:570:02, 02:572-02:643N, 02:645-02:828, 02:830:01-02:1206, 03:89:01, 30:13, 30:16, 30:22, 30:44, 30:46, B*15:01:83^w , B*35:01:60^w , B*58:01:24^w
3^{9,11}	205 bp, 235 bp	1070 bp	A1, A3, A11, A31, A32, A34, A36	*01:12, 01:19, 01:21, 01:126, 01:200, 01:244, 01:360, 01:427, 01:466, 03:01:01:01-03:17:02, 03:19-03:74, 03:76-03:94, 03:96-03:134, 03:136-03:176, 03:178N-03:186, 03:188-03:193, 03:195-03:199, 03:201-03:214, 03:216-03:224, 03:226-03:248, 03:250-03:259, 03:261-03:321, 03:323N-03:342N, 03:344:01-03:346, 03:348-03:376, 03:378-03:413, 03:415-03:467, 03:469-03:504N, 11:03:01:01-11:03:01:02, 11:20, 11:25:01-11:25:03, 11:60, 11:130, 11:158, 11:175, 11:209, 11:348, 11:366:01-11:366:02, 11:381, 11:478, 24:92, 24:458, 24:551, 24:557, 31:03 ^w -31:04:02 ^w , 31:176 ^w , 31:179 ^w , 31:220 ^w , 32:04, 32:142, 33:49 ^w , 33:144 ^w , 33:179 ^w , 33:201 ^w , 34:02:01:01-34:04, 34:07-34:10N, 34:13, 34:15, 34:20-34:22, 34:24-34:26N, 34:28-34:30N, 34:32-34:33, 36:02, 68:103:01-68:103:02, 74:23
4	190 bp	800 bp	A1, A3, A11, A30, A36, A68	*01:01:01:01-01:01:22, 01:01:24-01:01:47, 01:01:49-01:01:64, 01:01:67-01:01:78, 01:01:80-01:01:156, 01:01:158-01:04:01:02N, 01:06-01:07, 01:09:01-01:11N, 01:13, 01:15N ^w , 01:16N-01:18N, 01:20-01:29, 01:31N-01:33, 01:35-01:78, 01:80-01:98, 01:100-01:144, 01:146, 01:148, 01:150-01:158, 01:160N-01:166, 01:168-01:177, 01:179N-01:199, 01:201-01:204, 01:206-01:207, 01:209-01:213, 01:215-01:227, 01:229-01:235, 01:237-01:243, 01:245-01:266:02, 01:268-01:270, 01:272-01:278, 01:280-01:313, 01:315-01:375, 01:377-01:390, 01:392-01:395, 01:397-01:402, 01:404-01:417N, 01:419-01:426, 01:428-01:438, 01:440-01:465, 01:467-01:478, 02:78, 02:169, 02:829, 03:12, 03:18, 03:88, 03:135, 03:485,



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				11:01:01:01-11:27, 11:29-11:52Q, 11:54:01-11:486, 24:555, 25:43, 25:59, 26:19, 26:72, 26:184, 26:204:01:01-26:204:01:02, 29:67:01, 29:156, 30:08:01-30:08:02, 30:150, 32:64, 34:19, 36:04, 66:23, 68:13:01, 68:66:01-68:66:02, 68:134, 68:178, 74:19, C*12:131
5	135 bp, 200 bp	800 bp	A9, A23, A24, A29, A80	*23:01:01:01-23:56, 23:58-23:65, 23:67-23:68, 23:70-23:98, 23:100-23:112, 23:114-23:127, 23:129-23:136, 23:138-23:149, 24:24, 24:71, 24:315, 24:392, 24:527, 24:569, 29:07, 29:49, 31:29, 31:85, 32:72, 32:170, 33:187, 80:01:01:01-80:10, B*18:27
6	175 bp, 205 bp	1070 bp	A2, A3, A9, A23, A24, A26, A2403	*01:301Q, 02:17:02:01 ^w -02:17:04 ^w , 02:804, 03:347, 11:139, 23:14:01-23:14:02, 23:104-23:105, 23:141, 24:02:01:01-24:11N, 24:13:01-24:13:03, 24:17:01:01-24:50, 24:54-24:56:02, 24:58-24:63, 24:66-24:91, 24:93, 24:95-24:113, 24:115-24:137, 24:139-24:187, 24:189-24:210, 24:212-24:221, 24:223-24:227, 24:229-24:290, 24:292-24:295, 24:297-24:303N, 24:305-24:315, 24:317-24:323N, 24:325-24:411, 24:413-24:457, 24:459:01-24:470, 24:472-24:480, 24:482-24:514N, 24:516-24:550, 24:552-24:554, 24:556N, 24:558-24:573, 24:575-24:609, 24:611-24:648, 26:16, 30:163, 33:19, 33:119, 33:243, 68:45, 68:117, 68:322
7	165 bp, 200 bp	800 bp	A2, A3, A10, A11, A25, A26, A28, A32, A34, A66, A68, A69	*01:51, 01:344, 01:381, 02:55, 02:527, 02:582, 02:644, 02:741, 02:815, 03:24, 03:50, 03:475, 11:10, 11:183, 11:191, 11:269, 25:01:01:01-25:16, 25:18-25:33, 25:35-25:45, 25:47-25:53, 25:55-25:58, 25:60-25:70, 25:72-25:76:02, 25:78-25:80, 25:84-25:88, 25:90-25:94, 26:01:01:01-26:01:47, 26:01:49-26:03:01:02, 26:03:03-26:06, 26:08:01:01-26:15, 26:17-26:18, 26:20:01-26:43:02, 26:45-26:63, 26:65-26:71N, 26:73-26:88, 26:90-26:91, 26:93-26:176, 26:178-26:183, 26:185-26:206:02N, 26:208-26:253, 29:28, 29:176, 29:185, 32:15, 33:51, 34:01:01:01-34:18, 34:20-34:34, 66:01:01:01-66:22, 66:24-66:41, 66:43-66:49, 68:01:01:01-68:177, 68:179-68:249, 68:251N-68:326, 69:01:01:01-69:09
8^{6,7}	80 bp	800 bp	A2, A3, A25, A32, A53	*01:298, 02:81, 02:124, 02:829, 25:01:01:01-25:45, 25:47-25:58, 25:60-25:76:02, 25:79-25:80, 25:83-25:88, 25:90-25:94, 32:01:01:01-32:02, 32:04, 32:06-32:37, 32:39-32:59, 32:61-32:70, 32:72-32:77, 32:81-32:106:01:02, 32:108-32:191Q, B*07:81, B*08:52, B*18:67, B*38:41, B*38:67, B*49:67, B*51:01:110, B*51:185, B*53:05:01-53:05:02, B*53:16, B*53:33, B*57:01:38, B*57:60
9^{6,7,10}	80 bp, 200 bp, 240 bp	800 bp	A10, A26, A43	*01:43, 01:51, 02:644, 11:17, 11:40, 11:223, 11:271, 25:59, 26:01:01:01-26:02:02, 26:04, 26:07:01-26:20:02, 26:22-26:29, 26:31-26:43:02, 26:45-26:56, 26:58-26:77, 26:79-26:91, 26:93-26:110, 26:112:01-26:176, 26:178-26:226, 26:228, 26:230N-26:253, 29:105, 29:164, 33:13, 33:48, 43:01-43:03, 68:84, 68:227



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10^{6,10}	80 bp, 175 bp	1070 bp	A1, A9, A10, A11, A26, A34, A66	*01:13, 01:26, 01:28, 01:136, 01:176, 01:192, 01:229, 01:299, 01:380:01:01-01:380:01:02, 03:63, 03:88, 11:01:01:01-11:27, 11:29-11:52Q, 11:54:01- 11:270, 11:272Q-11:486, 24:19, 24:44, 24:555, 26:03:01:01-26:03:01:02, 26:03:03, 26:06, 26:21, 26:78, 26:92, 26:111, 26:152, 26:177, 26:193, 26:229, 30:125, 30:140, 33:184, 34:01:01:01-34:08, 34:10N-34:33, 66:01:01:01-66:01:07, 66:04-66:11, 66:13-66:14, 66:17-66:20, 66:22-66:24, 66:27N, 66:29-66:33, 66:35-66:38, 66:40-66:42, 66:44- 66:47, 66:49, 68:271, 69:02, 74:30, 80:02
11⁶	125 bp, 165 bp, 190 bp	800 bp	A10, A25, A26, A31, A34, A43, A66	*01:01:56, 01:361N, 02:309, 02:454, 03:01:19, 03:103:02, 11:11, 25:05-25:06, 26:09, 26:54, 26:91, 26:217, 26:229, 26:231, 26:251Q, 31:03-31:04:02, 31:123, 34:01:01:01-34:02:07, 34:03-34:34, 43:01- 43:03, 66:02:01:01-66:03:01:03, 66:16, 66:19, 66:21, 66:25-66:26Q, 66:28N, 66:34, 66:39N- 66:40, 66:43, 66:48, 68:130:01, 68:294, 74:01:03
12	175 bp, 225 bp	1070 bp	A1, A2, A3, A10, A25, A26, A34, A43, A66	*01:13, 01:176, 01:194, 02:34-02:35:03, 02:56:01- 02:56:02, 02:62, 02:103, 02:135, 02:580, 02:741, 02:907, 02:1171, 03:01:01:01-03:01:22, 03:01:24- 03:01:82, 03:01:84-03:01:93, 03:01:95-03:07:02, 03:09-03:11:02N, 03:13-03:31, 03:33-03:35, 03:37- 03:40, 03:42-03:56:01:02, 03:58, 03:60-03:71, 03:73-03:87, 03:90-03:106, 03:109-03:110, 03:112- 03:141, 03:143-03:151, 03:153-03:171, 03:174- 03:175, 03:177, 03:179-03:193, 03:195- 03:197:02N, 03:201-03:202, 03:204, 03:206- 03:210, 03:212-03:218, 03:220-03:251, 03:253- 03:259, 03:261-03:266N, 03:268-03:272, 03:274- 03:329N, 03:331-03:381N, 03:383-03:397, 03:399- 03:412, 03:414-03:428, 03:430-03:462, 03:464Q- 03:478, 03:480-03:497, 03:499-03:504N, 11:116, 11:140, 11:199:01-11:199:03, 11:222, 25:01:01:01- 25:05, 25:07-25:35, 25:37-25:42N, 25:44-25:49N, 25:51, 25:53-25:58, 25:60-25:64, 25:66-25:94, 26:01:01:01-26:01:86, 26:02:01 ^w -26:02:02 ^w , 26:03:01:01-26:03:01:02, 26:03:03, 26:05- 26:08:03, 26:10-26:28, 26:29 ^w , 26:30-26:43:02, 26:45-26:48, 26:49 ^w , 26:50-26:74, 26:76-26:77, 26:79-26:90, 26:92-26:203, 26:206:01N- 26:250:01:02, 26:252N-26:253, 30:55, 30:186, 31:24-31:25, 32:26:01-32:26:02, 32:152, 33:61, 33:190, 34:08, 43:01-43:03, 66:01:01:01-66:01:07, 66:04-66:09, 66:10 ^w , 66:11-66:15, 66:17-66:20, 66:22-66:24, 66:27N, 66:29-66:33, 66:35-66:38, 66:41-66:42, 66:44-66:47, 66:49, 68:71, 69:07, 74:13, 74:37
13^{6,10}	80 bp, 115 bp, 200 bp, 240 bp, 460 bp	1070 bp	A26, A29, A31, A34, A36, A68	*01:427, 02:237, 02:309, 02:454, 02:809, 02:927, 03:01:38, 03:95, 03:123:02, 03:171, 03:231:01, 03:343, 03:428, 11:130, 26:19, 26:22, 26:198, 29:01:01:01-29:200N, 31:03-31:04:02, 31:123, 32:42, 34:04, 36:02, 66:09, 68:19, 68:130:02



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14^{6,8,10,11}	90 bp, 135 bp, 205 bp	1070 bp	A1, A30	*01:13, 01:28, 01:176, 01:194, 01:229, 01:299, 03:43, 03:82, 03:186, 03:395, 11:113, 11:162, 11:282, 30:01:01:01-30:04:04, 30:06-30:20, 30:22- 30:237, 31:35, B*07:260, C*12:328
15	145 bp, 240 bp, 380 bp, 410 bp	1070 bp	A24, A31, A32	*02:237, 02:809, 02:927, 03:95, 03:343, 11:306, 11:440, 23:11N, 24:586N, 24:646, 29:14, 29:172, 31:01:02:01-31:233, 31:235, 32:05, 32:79, 32:128, 33:53, 33:125, 33:131, 33:249, 74:13, 74:44
16¹¹	140 bp, 180 bp, 235 bp, 260 bp	1070 bp	A1, A3, A25, A32, A74	*01:07, 01:95, 01:289, 01:298, 03:32, 03:43, 03:82, 03:152, 03:186, 03:219, 03:273, 03:429, 03:479, 23:64, 24:104, 24:243, 25:03, 25:30, 29:13, 29:39, 29:98, 30:89, 30:177, 31:21, 31:35, 32:01:01:01- 32:191Q, 74:07, 74:33, 74:48, 80:04, B*15:642
17	205 bp, 390 bp	1070 bp	A24, A31, A32, A33, A68, A74	*02:243:01-02:243:03, 02:929, 24:82, 24:646, 26:177, 26:207, 29:48, 29:105, 29:164, 31:08, 31:109, 32:05, 32:15, 32:79, 32:93, 33:01:01:01- 33:01:22, 33:03:01:01-33:37, 33:39-33:276, 68:29, 68:250, 74:04, 74:21, 74:43
18	340 bp, 375 bp	800 bp	A2, A19, A68, A74	*01:121, 02:65, 02:407, 02:449, 02:932, 03:246, 03:282, 11:07:02, 11:372, 68:25, 68:262, 74:01:01:01-74:52
19^{10,11,12}	210 bp, 240 bp	800 bp	A2, A25, A28, A68	*02:34-02:35:03, 02:46, 02:48, 02:56:01-02:56:02, 02:62, 02:70, 02:78, 02:103, 02:129, 02:571, 02:580, 02:651, 02:741, 02:907, 02:1050, 02:1095, 02:1171, 11:199:03, 25:05, 25:59, 25:88, 26:54, 26:122, 26:229, 68:01:01:01-68:01:66, 68:01:68- 68:217, 68:219-68:257, 68:259-68:326
20^{6,12}	65 bp, 240 bp, 375 bp, 545 bp	800 bp	A2, A26, A28, A32, A66, A68, A69	*02:55, 02:149:01-02:149:02, 02:243:01-02:243:03, 02:309, 02:644, 02:741, 02:815, 02:842, 02:947:01- 02:947:02, 23:57, 24:82, 25:30, 26:22, 26:177, 29:80, 29:155, 31:41, 32:06, 33:22, 33:252, 66:06, 66:09, 68:08:02, 68:29, 68:105:01:01-68:105:01:02, 68:157, 68:250, 68:276Q, 69:01:01:01-69:09, 74:35
21^{6,10}	75 bp, 155 bp, 240 bp, 495 bp	800 bp	A2, A3, A24, A26, A28, A36, A68, A80	*01:427, 01:466, 02:55, 02:237, 02:671, 02:809, 02:927, 03:41, 03:63, 03:75, 03:88, 03:95, 03:177, 03:343, 03:347, 03:377, 03:382, 11:130, 24:18, 24:204, 24:213, 26:03:01:01-26:03:01:02, 26:03:03, 26:05-26:06, 26:21, 26:30, 26:78, 26:111, 26:177, 26:227, 26:229, 33:24, 33:184, 36:02, 68:05, 68:15, 68:20, 68:109, 68:136, 68:255, 80:01:01:01- 80:01:02, 80:03-80:10, B*07:507, C*06:187

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

When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.

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



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reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

³The serological reactivity of all HLA-A alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

⁴For several HLA Class I alleles 1st and/or 4th exon(s) and beyond, as well as intron nucleotide sequences, are not 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. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

⁵The A* 23:66, 23:99, 23:128, 23:137, A*24:14:01:01-24:15, 24:51-24:53, 24:57, 24:64, 24:94, 24:114, 24:138, 24:188, 24:222N, 24:228, 24:291, 24:296, 24:304, 24:316, 24:324, 24:412, 24:481, 24:515, 24:574, 24:610, and A*31:234 alleles will not be amplified by this lot of A-B-DR-DQ. These alleles can e.g. be amplified by the HLA-A low resolution kit and/or the A-B-DR resolution kit.

⁶HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

⁷Primer mixes 8 and 9 may weakly amplify the A*34 alleles.

⁸Primer mix 14 may give rise to a lower yield of HLA-specific PCR product than the other HLA-A low primer mixes.

⁹Primer mix 3 may faintly amplify the A*30:04:01:01-30:04:04, 30:06, 30:09:01:01-30:09:01:02, 30:17, 30:29, 30:46, 30:77, 30:89-30:90, 30:99, 30:103, 30:105, 30:117 30:139, 30:150, 30:155, 30:160, 30:183, 30:212 and 30:230 alleles.

¹⁰Primer mixes 9, 10, 13, 14, 19 and 21 may have a tendency of giving rise to primer oligomer formation.

¹¹Primer mixes 3, 14, 16 and 19 may have a tendency of unspecific amplification.

¹²Primer mixes 19 and 20 may generate a false positive band of about 560 base pairs. This band should be disregarded when interpreting HLA-A low resolution typings.

Abbreviations

w: might be weakly amplified.



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SPECIFICITY TABLE

HLA-B low resolution primer set

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

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	HLA-B serol. ³	Amplified HLA-B alleles ⁴
22 ⁹	285 bp	1070 bp	7, 703, 8, 35, 40, 41, 42, 48, 60, 61, 81	*07:02:01:01-07:02:05, 07:02:07-07:02:38, 07:02:40-07:02:84, 07:02:86-07:06:06, 07:08:01-07:18:02, 07:20-07:32, 07:34-07:39, 07:41-07:52, 07:54-07:59, 07:61-07:76, 07:79-07:83, 07:85:01-07:99, 07:101-07:121, 07:123-07:138, 07:140-07:164, 07:166-07:192, 07:194-07:195, 07:199-07:213, 07:215-07:234, 07:236-07:238, 07:240-07:254, 07:256-07:342, 07:344-07:358, 07:360Q-07:385, 07:387-07:428, 07:430-07:441, 07:443-07:467Q, 07:469N-07:484, 07:486-07:506, 07:508-07:525, 08:01:01:01-08:01:20, 08:01:22-08:01:24, 08:01:26-08:05, 08:07-08:08N, 08:10-08:11, 08:13-08:15, 08:17-08:30N, 08:32-08:83, 08:85-08:88, 08:90-08:102, 08:104-08:106, 08:108-08:112, 08:114-08:115, 08:117-08:133, 08:135-08:168, 08:170-08:174, 08:176-08:183, 08:185-08:231, 08:233-08:253, 08:256-08:273, 08:275-08:290, 08:292-08:309, 08:311-08:314, 08:316-08:320, 08:322-08:332, 13:174, 15:297, 27:164, 35:66, 35:87, 35:530, 37:07, 40:15-40:16:01:02, 40:30-40:32, 40:34, 40:45, 40:59, 40:80, 40:98, 40:137, 40:160:01-40:160:02, 40:598, 41:02:01:01-41:02:13, 41:04, 41:10-41:11, 41:13, 41:18-41:19, 41:23-41:24, 41:27, 41:31, 41:36, 41:38-41:43, 41:45N-41:49, 41:51-41:52, 41:55, 41:58, 41:65, 41:68-41:69, 41:71-41:72, 41:74, 41:81-41:86, 42:01:01:01-42:02:02, 42:05:01-42:07, 42:09-42:13, 42:15-42:39, 44:150, 44:166, 44:342, 48:01:01:01-48:01:11, 48:01:13-48:01:14, 48:05-48:12, 48:14-48:20, 48:22, 48:27-48:39, 48:41-48:50, 48:52, 48:54-48:56, 48:58-48:63, 48:65, 48:67, 53:15, 81:01:01:01-81:16, C*03:260
23 ⁸	215 bp	1070 bp	8, 44	*08:01:01:01-08:05, 08:07-08:25, 08:27-08:49, 08:51-08:61, 08:63-08:64, 08:66-08:84, 08:86N-08:93, 08:95-08:122, 08:124-08:131, 08:133-08:225, 08:227, 08:229-08:238, 08:240-08:241, 08:243-08:262, 08:264, 08:266-08:271, 08:273-08:294, 08:296-08:298, 08:300Q-08:323Q, 08:325-08:332, 13:93, 15:142, 15:180, 15:429, 35:218, 35:256, 37:62, 40:328, 44:49, 44:156, 49:25, 51:68, 51:176, 52:77, C*06:147
24 ⁹	140 bp, 235 bp	1070 bp	7, 8, 13, 15, 35, 4005, 44, 49, 50, 61, 62, 77	*07:20, 07:24, 07:60, 07:100, 07:131, 07:220, 07:223, 07:358, 07:464, 07:485, 08:21, 08:25, 08:175, 13:01:01:01-13:02:39, 13:02:41-13:04, 13:06-13:08, 13:10-13:23, 13:25-13:38, 13:40-13:57, 13:59-13:66, 13:68-13:96, 13:99-13:182, 13:184-13:203, 15:07:01:01-15:07:03, 15:36 ^w , 15:45, 15:55, 15:68, 15:89:01 ^w -15:89:02 ^w , 15:126, 15:197:02, 15:207, 15:324, 15:329, 15:331, 15:360, 15:383, 15:405, 15:431, 15:450, 15:524, 15:661, 15:668, 15:673, 15:700, 35:05:01:01-35:05:07, 35:16-35:17:05, 35:22:01:01-35:22:01:02, 35:30:01:01-35:30:01:02, 35:51:01-35:51:02,



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25^{5,6,7,9}	105 bp, 140 bp, 260 bp	800 bp	12, 13, 14, 15, 17, 18, 21, 27, 35, 39, 40, 41, 44, 45, 47, 48, 49, 50, 57, 58, 60, 61, 62, 64, 65	*07:68:01-07:68:03, 07:100, 07:218, 07:220, 07:237, 07:262:01-07:262:02, 07:424, 07:485, 07:497, 07:522, 08:71, 08:118, 08:274, 08:296, 08:321, 13:01:01:01-13:01:09, 13:01:11-13:02:42, 13:02:44-13:04, 13:06-13:13:02, 13:15-13:23, 13:25-13:57, 13:59-13:82, 13:84-13:92, 13:94-13:96, 13:99-13:101, 13:102 ^w , 13:103N-13:105, 13:107-13:203, 14:01:01:01-14:02:08, 14:02:10-14:05, 14:07N, 14:09, 14:11-14:19, 14:21:01-14:36, 14:38-14:54, 14:57-14:95, 14:97-14:101N, 14:103-14:126, 14:128-14:129, 14:131N-14:139N, 15:07:01:01-15:07:03, 15:45-15:46, 15:53, 15:55, 15:68, 15:106, 15:126, 15:197:02, 15:207, 15:212, 15:324, 15:329, 15:331, 15:336, 15:347, 15:360, 15:383, 15:399, 15:405, 15:431, 15:450, 15:510, 15:559, 15:588, 15:661, 15:668, 15:673, 15:695, 15:700, 18:14, 18:44:01-18:44:02, 18:107, 27:32, 27:106, 27:138, 27:180, 27:224, 35:05:01:01-35:05:07, 35:22:01:01-35:22:01:02, 35:46-35:47, 35:51:01-35:51:02, 35:58, 35:63, 35:66, 35:72, 35:89, 35:97, 35:137, 35:147, 35:154, 35:182, 35:199, 35:207, 35:217, 35:232, 35:278, 35:317, 35:368, 35:389, 35:416, 35:427N, 35:440, 35:450, 35:459N, 35:472, 35:475, 35:481, 35:498-35:499, 35:509, 35:519, 35:540-35:541, 35:572, 35:604, 38:19, 39:03:01:01-39:03:02, 39:14:01:01-39:14:01:03, 39:24:01:01-39:24:03, 39:29, 39:37:01:01-39:37:01:02, 39:76, 39:79, 39:120, 39:144, 39:152, 39:182, 39:184-39:185, 39:216, 40:01:01-40:01:39, 40:01:41-40:01:92, 40:07, 40:10:01:01-40:10:02, 40:14:01-40:16:01:02, 40:22N-40:23, 40:25, 40:30-40:36, 40:38, 40:42-40:43, 40:45-40:49, 40:51-40:55, 40:58-40:63, 40:65-40:67, 40:69, 40:71-40:73, 40:76-40:77, 40:79-40:81, 40:84, 40:87:01-40:88, 40:92, 40:100-40:102, 40:106, 40:108, 40:110, 40:112-40:114:02, 40:116-40:118N, 40:121, 40:123-40:126, 40:128-40:130:02, 40:132, 40:134-40:136, 40:139-40:141, 40:146-40:147, 40:150-40:156, 40:158, 40:160:01-40:160:02, 40:163-40:164, 40:166, 40:168, 40:170-40:172, 40:174-40:175, 40:178-40:179, 40:182-40:183, 40:186:01-40:188, 40:191-40:199, 40:204, 40:207-40:208, 40:212-40:213, 40:215-40:219, 40:221-40:223, 40:227-40:228, 40:231, 40:233-40:242, 40:245:01-40:245:02, 40:247, 40:249-40:250, 40:252-40:253, 40:257-40:265N, 40:272-40:273, 40:277-40:282, 40:285-40:286N, 40:288, 40:298:01-40:301, 40:308, 40:310, 40:312, 40:315-40:316, 40:319, 40:321, 40:323:01-40:327, 40:329, 40:332-40:333, 40:336, 40:338N-40:339, 40:342, 40:344, 40:346, 40:352-40:353:02, 40:355, 40:357-40:358, 40:360, 40:367-40:368, 40:370, 40:372N, 40:377, 40:379:01:01-40:383, 40:385-40:386, 40:391-40:392, 40:394-40:398, 40:400-40:404,



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26 ⁷	185 bp, 235 bp	800 bp	7, 16, 17, 27, 2708, 37, 38, 39, 3901, 3902, 64, 67	*07:02:32, 07:85:02, 07:197, 14:01:01:01-14:01:05, 14:01:07-14:01:15, 14:07N-14:08:02, 14:10, 14:12, 14:14, 14:19, 14:26, 14:32, 14:40, 14:46-14:47, 14:49, 14:53-14:55, 14:65, 14:71, 14:77-14:78, 14:80-14:83, 14:86-14:87, 14:95, 14:97, 14:102-14:105, 14:108Q, 14:112-14:113N, 14:117, 14:121, 14:124, 14:128, 14:134, 14:137, 14:139N, 18:01:37, 18:37:03, 18:165, 27:01-27:05:15, 27:05:17-27:05:19, 27:05:21-27:05:37, 27:05:39-27:06:02, 27:07:04, 27:08-27:10, 27:12:01:01-27:13:02, 27:16-27:18, 27:20, 27:23, 27:26-27:27, 27:29, 27:31, 27:35-27:37, 27:39-27:42, 27:44-27:46, 27:48-27:61, 27:64N-27:69, 27:72-27:75, 27:77-27:80, 27:82-27:124, 27:126, 27:128-27:129, 27:131-27:137, 27:140-27:149, 27:151-27:152, 27:154-27:163, 27:165-27:179, 27:181-27:186, 27:188-27:212N, 27:214, 27:216-27:217, 27:220-27:232, 27:234-27:243N, 27:245-27:248, 27:250, 27:252-27:268, 27:270-27:281, 27:283, 27:286-27:287N, 37:02, 38:01:01:01-38:01:07, 38:01:09-38:01:18, 38:01:20-38:02:02:02, 38:02:04-38:03, 38:07-38:24, 38:26-38:32, 38:34N-38:83N, 38:84 ^w , 38:85-38:88, 38:90-38:111, 38:113N-38:122, 38:160-38:173Q, 39:01:01:01-39:01:01:30, 39:01:03:01-39:01:08, 39:01:10-39:01:25, 39:01:27-39:01:29, 39:01:31-39:01:37, 39:01:39-39:02:01:02, 39:03:01:01-39:03:02, 39:05:01:01-39:06:02:10, 39:06:04-39:09:06, 39:11, 39:14:01:01-39:15, 39:18, 39:19:02, 39:22, 39:24:01:01-39:24:02, 39:25N-39:39:01, 39:40:01N-39:44,



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

When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.

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.



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

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

³The serological reactivity of all HLA-B alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

⁴For several HLA Class I alleles 1st and/or 4th exon(s) and beyond, as well as intron nucleotide sequences, are not 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. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

⁵HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

⁶Primer mix 25 may give rise to a lower yield of HLA-specific PCR product than the other HLA-B low resolution primer mixes in B*40, B*41, B*45, B*49 and B*50 alleles.

⁷Primer mixes 25, 26, 30, 38, 48, 57 and 62 may give rise to a lower yield of HLA-specific PCR product than the other HLA-B low resolution primer mixes.

⁸Primer mixes 23, 29, 30, 34, 38, 56, 59 and 63 may have tendencies of unspecific amplifications, most pronounced in primer mix 30.

⁹Primer mixes 22, 24, 25, 39, 40, 41, 47, 59 and 62 have a tendency giving rise to primer oligomer formation.

¹⁰The B*15, B*46, B*57, B*58 and C*03 alleles may be faintly amplified by primer mix 30.

¹¹Primer mix 57 may give rise to a lower yield of B*54 alleles than the other B low primer mixes.

¹²The C*17 alleles might be faintly amplified by primer mix 45.

¹³The Bw4-associated HLA-A specificities A23, A24, A2403, A25 and A32 are not amplified by the primer pair in primer mix 63.

¹⁴In primer mix 34 the positive control band may be weaker than for other HLA-B low resolution primer mixes.

Abbreviations

w: might be weakly amplified.

?: nucleotide sequence information not available for the primer matching sequence.



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SPECIFICITY TABLE

DR low resolution primer set

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

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	DR serology ³	Amplified HLA-DRB alleles ^{4,11}
65 ⁶	210 bp, 235 bp, 260 bp	515 bp	1	*01:01:01:01-01:02:14, 01:04:01-01:38, 01:40N-01:98, 01:100-01:101, 01:103-01:111, 01:113-01:126, 01:128-01:154
66	200 bp	430 bp	1, 103	*01:03:01:01-01:03:05, 01:39N, 01:42, 01:61, 01:89, 01:99, 01:102, 01:112, 01:127, 01:155
67 ⁷	200 bp, 230 bp	430 bp	2, 15	*15:01:01:01-15:235, 16:66
68 ⁷	210 bp	430 bp	11, 16	*11:30, 11:288, 12:57, 16:01:01:01-16:05:02, 16:07-16:79, DRB3*02:111
69 ^{5,9}	125 bp, 230 bp	515 bp	3, 11, 13, 17, 18	*03:01:01:01-03:11:01, 03:11:03-03:125, 03:127-03:217, 11:07:01-11:07:02, 11:27:02-11:27:03, 11:84:02-11:84:03, 11:103:01-11:103:02, 11:105, 11:107, 11:124:02-11:125, 11:136, 11:173, 13:33:01, 13:61:02, 13:94:01, 13:96:01, 14:38:02, 14:104, 14:111, 14:171, 15:25, 15:37:01, 15:57:02, 15:100, 15:104:01
70 ^{5,9}	75 bp, 210 bp	430 bp	3, 6, 11, 13, 14, 17	*03:01:01:01-03:01:23, 03:01:25-03:01:41, 03:04:01-03:06, 03:08-03:11:01, 03:11:03-03:16, 03:18-03:20, 03:22-03:23, 03:25:01-03:26, 03:28, 03:30-03:31, 03:33-03:34, 03:36-03:37, 03:43-03:48, 03:50-03:52:02, 03:54-03:68N, 03:70-03:73, 03:75-03:86, 03:89, 03:91-03:93, 03:95-03:96, 03:98-03:100:02, 03:104, 03:106-03:110, 03:112-03:114, 03:116-03:118, 03:121-03:130, 03:132-03:149, 03:151-03:153, 03:156N-03:161, 03:163-03:166, 03:168-03:170, 03:172, 03:174N-03:175, 03:177, 03:180-03:184, 03:186-03:187, 03:189N, 03:191-03:205, 03:207-03:210, 03:214, 03:216-03:218N, 08:40, 08:92, 11:02:01:01-11:03:04, 11:11:01, 11:11:03, 11:14:01:01-11:14:02, 11:16:01:01-11:16:01:02, 11:20-11:21, 11:36, 11:40-11:41, 11:48, 11:59, 11:63:01-11:63:02, 11:65:01-11:65:02, 11:68, 11:70, 11:73, 11:76, 11:79-11:80, 11:83, 11:85-11:87:02, 11:93, 11:118:01-11:118:02, 11:122, 11:124:01-11:124:02, 11:127, 11:131-11:132, 11:135, 11:138-11:139, 11:142, 11:151, 11:153, 11:161, 11:168, 11:171, 11:176, 11:182, 11:184, 11:213, 11:229, 11:231, 11:233, 11:237, 11:241-11:242, 11:251, 11:256, 11:260, 11:270, 11:276, 11:290, 11:293, 11:301N, 11:319, 11:334-11:335, 11:338, 12:73, 13:01:01:01-13:02:01:14, 13:02:02 [?] , 13:02:03-13:04, 13:08, 13:10, 13:15-13:17, 13:19-13:20:01:03, 13:22:01:01-13:24:01:03, 13:27:01-13:29:01:02, 13:31-13:41, 13:43, 13:45, 13:48, 13:51-13:54,



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71⁵	85 bp, 210 bp	430 bp	3, 6, 11, 13, 14, 1403, 18	*03:02:01:01-03:03, 03:27, 03:29, 03:38, 03:53, 03:74, 03:88, 03:90, 03:102-03:103, 03:115, 03:119, 03:126, 03:131, 03:154, 03:167, 03:176-03:177, 03:179, 03:206, 03:211-03:212, 03:215, 11:13:01 ^w -11:13:02 ^w , 11:26, 11:34, 11:267, 13:15, 13:19, 13:26:01-13:26:02, 13:44, 13:53, 13:57, 13:85-13:86, 13:104, 13:193, 13:198, 13:206, 13:235, 13:353, 14:02:01:01-14:03:02, 14:06:01-14:06:06, 14:09, 14:12:01-14:13, 14:17-14:21, 14:24, 14:27:01-14:27:02, 14:29-14:30, 14:32:01 ^w -14:32:02 ^w , 14:33, 14:40-14:41, 14:47-14:49, 14:51, 14:63, 14:65 ^w , 14:67, 14:77-14:78, 14:80-14:81, 14:83, 14:85, 14:89, 14:94, 14:98, 14:102, 14:106, 14:108-14:109, 14:115, 14:119, 14:121, 14:135, 14:146, 14:154, 14:156, 14:159-14:160, 14:165, 14:170, 14:174, 14:176-14:177, 14:179, 14:181, 14:183, 14:194-14:195N, 14:198, 14:200, 14:209, 14:212, 14:218, 14:221-14:223, 14:226, 14:239, 14:242:01-14:242:02, 14:252, 14:261, 14:263, 14:272
72^{5,6,7}	100 bp, 175 bp	430 bp	3, 4	*04:01:01:01-04:05:11, 04:05:13-04:381, 04:383-04:391, DRB3*02:190
73⁷	180 bp, 205 bp, 230 bp	430 bp	7, 13, 14	*07:01:01:01-07:01:01:02, 07:01:01:04-07:01:35, 07:03-07:166, 08:67, 08:92, 08:108, 10:11, 11:229, 11:270, 12:22, 12:73, 12:88, 13:17, 13:116, 13:175, 13:214, 13:366, 14:50:01, 14:273
74⁵	120 bp, 215 bp, 250 bp	515 bp	7, 8, 14	*07:06, 08:01:01:01-08:01:02, 08:01:04-08:19, 08:21-08:30:03, 08:32-08:56, 08:58-08:66, 08:68:01-08:79, 08:81-08:97, 08:99-08:128, 08:130-08:134, 11:67, 11:193:01-11:193:02, 12:16:01-12:16:03, 12:22, 12:39:01-12:39:02, 13:171:01, 13:197, 14:15, 14:68:01-14:68:02, 14:93
75^{5,10}	85 bp, 100 bp, 135 bp, 165 bp, 195 bp	430 bp	3, 9, 11	*03:08, 03:65, 03:140, 09:01:02:01-09:61N, 11:07:01-11:07:02, 11:103:01-11:103:02, 11:105, 11:107, 11:125, 11:173, DRB3*01:42, DRB5*02:31, DRB5*02:34



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76^{5,6}	70 bp, 175 bp	430 bp	10, 11, 13	*03:76, 03:125, 03:174N, 03:218N, 09:53, 10:01:01:01, 10:01:01:03-10:46, 11:59, 11:80, 11:83, 11:87:01-11:87:02, 11:135, 11:142, 11:182, 13:27:01-13:27:02, 13:41, 13:71, 13:129, 13:176, 13:277, 13:326, 13:355, 14:179
77⁵	100 bp, 170 bp	430 bp	3, 8, 11, 13, 14	*03:08, 03:65, 03:140, 08:31, 08:41, 08:63, 08:75, 11:01:01:01, 11:01:01:03-11:11:01, 11:11:03-11:70, 11:72-11:263, 11:265-11:292, 11:294N-11:338, 11:340
78⁵	90 bp, 110 bp	430 bp	12, 14	*08:32, 08:53, 08:87, 12:01:01:01-12:56, 12:58- 12:114, 13:366, 14:52
79⁶	210 bp, 235 bp	430 bp	6, 8, 11, 13, 14, 1403	*03:76, 03:125, 03:174N, 03:218N, 08:20-08:21, 08:129, 11:01:01:01, 11:01:01:03-11:01:27, 11:01:28 [?] , 11:01:29-11:04:25, 11:06:01-11:06:03, 11:08:01-11:11:01, 11:11:03-11:12:03, 11:14:01:01- 11:16:01:02, 11:18-11:21, 11:23:01-11:25, 11:27:01- 11:33, 11:35-11:51, 11:54:01-11:54:02, 11:56- 11:66:02, 11:68, 11:70, 11:72-11:81, 11:83-11:88, 11:90-11:97, 11:99-11:102:02, 11:106, 11:108- 11:124:02, 11:126-11:135, 11:137-11:142, 11:144- 11:158, 11:160-11:172, 11:174-11:192, 11:194:01- 11:201, 11:203-11:208, 11:210-11:228, 11:230- 11:260, 11:262-11:265, 11:268-11:269, 11:271- 11:282, 11:284-11:308, 11:310-11:340, 12:57, 13:01:01:01-13:02:01:14, 13:02:03-13:08, 13:10- 13:16:01:02, 13:18-13:43, 13:45-13:85, 13:87- 13:115, 13:117:01:01-13:128, 13:130-13:145, 13:147-13:174, 13:176-13:182, 13:184-13:191, 13:194-13:205, 13:207-13:209, 13:212-13:213, 13:215-13:221, 13:223-13:247, 13:249N-13:288, 13:290-13:298N, 13:300-13:313, 13:315-13:325, 13:327-13:330, 13:332-13:340, 13:342-13:365, 13:367N, 14:03:01-14:03:02, 14:12:01-14:12:02, 14:16, 14:19, 14:21-14:22, 14:25:01-14:25:02, 14:27:01-14:27:02, 14:40, 14:53, 14:63, 14:67, 14:69, 14:74, 14:77-14:78, 14:84-14:85, 14:98, 14:102, 14:105, 14:109, 14:115-14:116, 14:128, 14:135, 14:144, 14:156, 14:173-14:174, 14:181, 14:218, 14:222N-14:223, 14:235, 14:239, 14:252, DRB3*02:27, DRB3*02:111, DRB3*02:131, DRB3*02:160
80⁶	195 bp, 225 bp	430 bp	6, 8, 11, 12, 13, 14	*03:125, 08:01:01:01-08:01:02, 08:01:04-08:01:05, 08:01:07-08:02:07, 08:04:01:01-08:09:02, 08:11:01:01-08:11:01:02, 08:16-08:17, 08:20-08:22, 08:24:01-08:24:02, 08:26, 08:28, 08:31, 08:39, 08:41-08:44, 08:50, 08:52, 08:54-08:55, 08:57, 08:59, 08:64, 08:67, 08:70, 08:72-08:73, 08:75, 08:77-08:80, 08:82-08:90, 08:92-08:94, 08:96, 08:98- 08:101, 08:103, 08:105-08:109, 08:111-08:114, 08:116-08:118, 08:120, 08:122-08:127, 08:129- 08:130, 08:132-08:134, 11:01:01:01, 11:01:01:03- 11:01:17, 11:01:20-11:01:47, 11:01:49-11:04:20, 11:04:22-11:06:03, 11:09:01:01-11:11:01, 11:11:03- 11:12:03, 11:14:01:01-11:16:01:02, 11:20-11:21, 11:23:01-11:25, 11:27:01-11:30, 11:32-11:33, 11:35- 11:41, 11:43:01:01-11:44, 11:46:01-11:51,



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81⁹	175 bp, 240 bp	430 bp	3, 4, 6, 8, 11, 13, 14, 1403, 1404, 17, 18	*03:01:01:01-03:01:05, 03:01:07-03:01:08, 03:01:10-03:07:02, 03:09, 03:11:01, 03:11:03-03:41:02, 03:43-03:45, 03:47-03:63, 03:66-03:68N, 03:70-03:86, 03:88-03:91, 03:93-03:110, 03:112-03:129, 03:131-03:139, 03:141-03:155, 03:157-03:161, 03:163-03:172, 03:174N-03:188, 03:191-03:218N, 08:09:02, 08:20, 08:129, 11:03:04, 11:04:17, 11:13:01-11:13:02, 11:17, 11:149, 11:202, 11:264, 12:20, 13:01:01:01-13:01:40, 13:01:42-13:16:01:02, 13:18-13:42:02, 13:44, 13:46-13:66:02, 13:68-13:102, 13:104-13:115, 13:117:01:01-13:121, 13:123-13:158:02, 13:161-13:164, 13:166-13:170, 13:171:02-13:174, 13:176-13:178, 13:180-13:190, 13:192-13:194, 13:196, 13:198-13:213, 13:215-13:216, 13:218-13:227, 13:229-13:247, 13:249N-13:298N, 13:300-13:365, 13:367N, 14:01:01:01-14:01:01:03, 14:01:02[?]-14:01:04[?], 14:01:05-14:04:01:03, 14:04:02[?]-14:04:03[?], 14:04:04-14:04:06,



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82^{5,6}	75 bp, 100 bp, 140 bp, 170 bp, 195 bp, 240 bp	430 bp	4, 6, 8, 13, 14, 1404	*04:62, 04:69, 04:73:01-04:73:02, 04:105:01-04:105:02, 04:122, 04:146, 04:162, 04:251, 04:284:01-04:284:02, 07:128, 08:08, 11:69, 11:82, 11:88, 11:293, 13:45, 13:197, 13:314, 14:01:01:01-14:01:02, 14:01:04-14:01:05, 14:04:01:01-14:04:09, 14:07:01-14:07:03, 14:10:01:01-14:10:01:02, 14:16, 14:22, 14:25:01-14:26, 14:28, 14:31-14:32:03, 14:35, 14:37-14:39, 14:49-14:50:02, 14:53-14:54:01:17, 14:54:03-14:55, 14:57-14:58, 14:60-14:62, 14:68:01-14:71, 14:73-14:76, 14:79, 14:82, 14:86-14:88, 14:90, 14:93, 14:99, 14:101, 14:104-14:105, 14:107, 14:110-14:114, 14:117-14:120, 14:122, 14:124-14:125, 14:128-14:129, 14:131, 14:137N-14:140, 14:142-14:143, 14:145-14:147, 14:149-14:153, 14:157-14:158, 14:163-14:164, 14:166N, 14:168 ^w , 14:171-14:173, 14:178, 14:180, 14:182, 14:184, 14:186, 14:189-14:192, 14:196-14:197N, 14:199, 14:201-14:205:01, 14:207-14:208, 14:210Q, 14:213-14:217, 14:219-14:220, 14:224-14:225, 14:227-14:235, 14:237-14:238, 14:240-14:241, 14:243-14:245, 14:247-14:250, 14:253-14:256, 14:258-14:259, 14:266-14:270, 14:273, 15:167, 15:172:02, 15:214, DRB3*03:67, DRB4*01:03:01:02N, DRB4*01:03:01:13N, DRB4*01:14N



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83^{5,6,8}	110 bp, 140 bp, 170 bp	430 bp	3, 4, 6, 9, 11, 13, 14, 1404	*03:10, 03:126, 03:177, 04:211, 09:01:02:01- 09:01:05, 09:01:07-09:02:02, 09:04-09:22, 09:24- 09:28, 09:30-09:52N, 09:54-09:61N, 11:13:01- 11:13:02, 11:17, 11:52, 11:202, 12:66, 12:96, 13:43, 13:159, 13:171:01, 13:179, 13:191, 13:193, 13:217, 14:01:01:01-14:02:12, 14:04:01:01-14:11:01:02, 14:13-14:14, 14:16-14:18, 14:19 ^w , 14:20, 14:21 ^w , 14:22-14:23:04, 14:26, 14:28-14:36, 14:38:01-14:39, 14:41, 14:43-14:52, 14:54:01:01-14:54:03, 14:54:04 ^w , 14:54:05-14:57, 14:59-14:62, 14:64-14:65, 14:68:01- 14:68:02, 14:70-14:76, 14:79-14:83, 14:86-14:88, 14:90-14:97, 14:99-14:101, 14:103-14:108, 14:109 ^w , 14:110-14:114, 14:117-14:127:02, 14:129-14:134, 14:137N-14:140, 14:142-14:143, 14:145-14:155, 14:157-14:160, 14:162-14:173, 14:175-14:180, 14:182, 14:184-14:185, 14:187-14:207, 14:209- 14:217, 14:219-14:221, 14:224-14:225, 14:227- 14:238, 14:240-14:249, 14:251, 14:253-14:256, 14:258-14:261, 14:263, 14:265-14:271, 14:273, 15:27, 15:34, 15:54, 15:66:01-15:66:02, 15:122, 15:158, 15:187
84^{5,6,7}	110 bp, 150 bp, 180 bp, 220 bp	430 bp	2, 3, 4, 6, 8, 11, 13, 14, 1403, 1404, 16	*03:10, 03:157, 08:03:11 ^w , 08:09:01-08:09:02, 08:20- 08:21, 08:32, 08:35, 08:36:02, 08:53, 08:68:01 ^w , 08:70 ^w , 08:87 ^w , 08:129, 11:13:01-11:13:02, 11:17, 11:23:01-11:23:02, 11:25, 11:31, 11:45, 11:52, 11:55, 11:64, 11:89, 11:96, 11:119, 11:148, 11:159, 11:202, 11:266, 11:283, 11:293, 11:312, 12:96, 13:13, 13:18, 13:43, 13:45, 13:47, 13:55, 13:119, 13:144, 13:146, 13:154, 13:156, 13:158:01-13:159, 13:164, 13:171:01, 13:179, 13:191, 13:197, 13:217, 13:232, 13:286, 13:331, 13:340, 14:01:01:01-14:01:05, 14:03:01-14:05:05, 14:07:01-14:08, 14:10:01:01- 14:12:02, 14:14-14:16, 14:18, 14:22-14:23:04, 14:25:01-14:28, 14:31-14:32:03, 14:34-14:36, 14:38:01-14:40, 14:42-14:45, 14:49-14:50:02, 14:53- 14:65, 14:67-14:79, 14:81-14:82, 14:84-14:93, 14:95- 14:97, 14:99-14:105, 14:107, 14:110-14:120, 14:122- 14:140, 14:142-14:158, 14:160-14:164, 14:166N- 14:169, 14:171-14:175, 14:178, 14:180-14:182, 14:184-14:193, 14:196-14:197N, 14:199-14:208, 14:210Q-14:211, 14:213-14:220, 14:222N-14:225, 14:227-14:241, 14:243-14:249, 14:251-14:256, 14:258-14:260, 14:265-14:273, 15:21 ^w , 15:158 ^w , 15:187 ^w , 16:04:01 ^w -16:04:02 ^w , 16:18 ^w , DRB3*02:131, DRB4*01:31
85^{5,6,9}	80 bp, 110 bp, 160 bp, 190 bp, 240 bp	515 bp	12, 52	*12:05, 12:15, 12:57, 14:141, 14:257, 14:262, DRB3*01:01:02:01-01:133N, DRB3*02:01-02:215, DRB3*03:01:01:01-03:21, DRB3*03:23-03:78
86⁶	130 bp, 215 bp	430 bp	53	*01:139, 03:211, 10:19, 14:217, 15:141, DRB4*01:01:01:01, DRB4*01:01:01:03- 01:03:01:24, 01:03:01:26-01:190, DRB4*02:01N, DRB4*03:01N



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87	175 bp, 215 bp	430 bp	51	DRB5*01:01:01:01:01:01:09, DRB5*01:01:01:11:01:130, DRB5*01:132-01:143, DRB5*02:02:01-02:39
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¹Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of DR low resolution SSP typings.

When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.

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

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

PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings. Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherent feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases. In the presence of a specific amplification the intensity of the control band often decreases.

³The serological reactivity of all DRB alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

⁴For several DRB1 alleles 1st and/or 3rd exon(s) and beyond, as well as intron nucleotide sequences, are not 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. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

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

⁶Primer mixes 65, 72, 76, 79, 80 and 82 to 86 have a tendency giving rise to primer oligomer formation.

⁷Primer mix 67, 68, 72, 73 and 84 may have a tendency for unspecific amplification.

⁸Primer mix 83 has a tendency of primer oligomer formation and also has an intense primer cloud due to the high number of primers present in the primer mix.

⁹Due to sharing of sequence motifs in codon 38 and 47, DRB3*01:14 will also be amplified in primer mixes 69, 70 and 81, and DRB3*01:23 and 02:32 in primer mix 69, in addition to primer mix 85.

¹⁰Primer mix 75 may give rise to a lower yield of HLA-specific PCR product than the other DR low resolution primer mixes.

¹¹The primers in this kit do not amplify the DRB1*04:382, DRB1*13:299 or DRB5*01:131N alleles.

Abbreviations

w: might be weakly amplified.

?: nucleotide sequence information not available for the primer matching sequence.



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SPECIFICITY TABLE

DQ low resolution primer set

Specificities and sizes of the PCR products of the 8+1 primer mixes used for
DQ low resolution SSP typing

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	DQ serology ³	Amplified DQB1 alleles ^{4,10}
88	135 bp, 195 bp, 230 bp	515 bp	5, 6	*05:01:01:01-05:343, 05:345-05:357, 06:23, 06:156, 06:162, 06:169, 06:325, 06:342, 06:389
89 ^{5,6}	65 bp, 110 bp, 135 bp, 160 bp, 185 bp, 220 bp, 270 bp	515 bp	1, 5, 6	*03:23:01, 03:259, 05:01:51, 05:43:02 ^w , 05:62, 05:344, 06:01:01:01-06:05:01, 06:05:02 [?] , 06:06- 06:219, 06:221-06:324, 06:326-06:525
90 ⁶	210 bp	430 bp	2	*02:01:01:01-02:01:09, 02:01:11-02:01:13, 02:01:15-02:217, 02:219-02:233, 02:235-02:245
91 ⁷	130 bp, 220 bp	515 bp	3, 7	*03:01:01:01-03:01:01:12, 03:01:01:14-03:01:68, 03:04:01:01-03:04:04, 03:09-03:10:03, 03:13- 03:14:02, 03:16, 03:19:01:01-03:19:06, 03:21- 03:22:02, 03:24, 03:27-03:29, 03:35-03:36, 03:42, 03:44, 03:46-03:60, 03:69, 03:71, 03:73, 03:75- 03:77, 03:80, 03:82-03:84N, 03:92-03:94, 03:101- 03:103, 03:108-03:109, 03:114-03:116, 03:118N- 03:122, 03:127-03:131, 03:133-03:135, 03:138- 03:140, 03:142-03:144, 03:147-03:148, 03:150, 03:152, 03:154, 03:157-03:160, 03:162-03:167, 03:169-03:173, 03:180, 03:182-03:183, 03:186- 03:188, 03:191-03:198:02, 03:201-03:202, 03:206- 03:208, 03:216, 03:218-03:219, 03:231-03:232, 03:235-03:236, 03:241-03:243, 03:246, 03:252- 03:257, 03:260, 03:264, 03:266-03:268, 03:271, 03:275-03:276N, 03:281, 03:284-03:286, 03:288, 03:290-03:294, 03:297, 03:302-03:303N, 03:305- 03:307, 03:309:01-03:309:02, 03:311-03:312, 03:317:01-03:318, 03:326-03:331, 03:335, 03:338N, 03:340N-03:342, 03:347, 03:350, 03:353- 03:355, 03:358N, 03:360-03:361:02, 03:366, 03:370, 03:372-03:373, 03:376N-03:378, 03:380- 03:381, 03:385N, 03:387, 03:389-03:391, 03:394, 03:396, 03:399N-03:401, 03:404, 03:407N-03:408, 03:417-03:421, 03:423-03:428, 03:430-03:432, 03:434-03:436, 03:438-03:439, 03:443, 03:448- 03:449, 03:451, 03:454-03:455, 03:458, 03:460, 03:465, 03:467-03:470, 03:472-03:476, 03:480Q, 03:482-03:483, 03:485-03:486, 03:488:01N- 03:488:02N, 03:491-03:492, 03:496-03:497, 03:499N, 03:503, 03:506:01:01-03:506:01:02, 03:508, 03:513-03:514, 03:519-03:520, 03:522, 03:524, 03:526-03:531, 03:534, 03:537-03:539,



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				03:542N, 03:544, 03:546, 03:549-03:550, 03:552-03:553, 03:555-03:557, 03:562-03:565, 03:569, 03:571-03:572, 06:209, 06:475
92⁷	130 bp, 220 bp	515 bp	6, 8	*03:02:01:01-03:02:47, 03:05:01-03:05:05, 03:07-03:08, 03:11, 03:18, 03:32, 03:37, 03:45:01-03:45:02, 03:61, 03:63-03:64, 03:66N-03:68, 03:70, 03:85, 03:104, 03:106-03:107, 03:125, 03:132, 03:146, 03:153, 03:161, 03:174-03:175, 03:178-03:179, 03:181, 03:184-03:185, 03:189-03:190, 03:199, 03:203-03:205, 03:210-03:211, 03:213N-03:215, 03:220-03:221, 03:223-03:224, 03:226, 03:228-03:229, 03:233, 03:237N, 03:240, 03:245, 03:247, 03:250-03:251, 03:261-03:263:01:02, 03:265, 03:269N, 03:273-03:274, 03:277-03:279, 03:287, 03:289, 03:295-03:296, 03:298-03:301, 03:310N, 03:315, 03:320-03:324, 03:333-03:334N, 03:339N, 03:343-03:346, 03:348-03:349, 03:352, 03:362, 03:364, 03:367-03:369, 03:371, 03:379, 03:383, 03:386, 03:388, 03:392, 03:403N, 03:409-03:410, 03:412, 03:415-03:416, 03:422N, 03:429, 03:433, 03:437, 03:440N-03:442, 03:444, 03:446-03:447, 03:450, 03:452, 03:456-03:457, 03:459, 03:462-03:464, 03:466, 03:471, 03:479, 03:481, 03:484, 03:490, 03:493, 03:495, 03:498, 03:500:01, 03:501-03:502, 03:504, 03:511-03:512, 03:515, 03:517, 03:525, 03:533, 03:535, 03:540-03:541N, 03:543, 03:547-03:548, 03:554, 03:558-03:559, 03:561, 03:566-03:567, 03:570, 04:75, 06:29, 06:123, 06:139, 06:337, 06:524
93^{7,8}	135 bp	515 bp	2, 3, 9	*02:77, 02:180:01-02:180:02, 03:03:02:01-03:03:25, 03:03:27-03:03:29, 03:03:31-03:03:34, 03:06, 03:12, 03:15, 03:20, 03:23:03, 03:25:01-03:26, 03:30-03:31, 03:33-03:34, 03:38:01-03:41, 03:43, 03:65, 03:74, 03:79, 03:86-03:91Q, 03:95N-03:99Q, 03:104-03:105, 03:111-03:113, 03:117, 03:123-03:124, 03:126, 03:136-03:137, 03:141, 03:145, 03:149, 03:155-03:156, 03:168, 03:176-03:177, 03:200, 03:209, 03:212, 03:217:02, 03:222, 03:227, 03:230, 03:234, 03:238-03:239, 03:248-03:249, 03:258, 03:270, 03:280, 03:282N-03:283, 03:304, 03:313, 03:316, 03:319, 03:332, 03:336-03:337, 03:351, 03:356N-03:357N, 03:359, 03:363, 03:365, 03:374-03:375N, 03:382:01-03:382:02, 03:384, 03:393, 03:395, 03:397-03:398, 03:402, 03:405-03:406, 03:411N, 03:414, 03:445, 03:453, 03:461, 03:477-03:478, 03:487, 03:489, 03:494, 03:505, 03:507, 03:509N-03:510, 03:516, 03:518, 03:521, 03:523, 03:532, 03:536, 03:545, 03:551N, 03:560N, 03:568, 04:03:01-04:03:03, 06:02:43, 06:03:10, 06:03:33, 06:51:01, 06:66, 06:96:01, 06:118:04, 06:168, 06:172, 06:322:01-06:322:02, 06:377
94^{5,7,8}	85 bp, 145 bp, 185 bp	515 bp	3, 7, 8, 9	*02:01:42, 03:01:01:01-03:01:01:12, 03:01:01:14-03:01:33, 03:01:35-03:03:15, 03:03:17-03:103, 03:105-03:153, 03:155-03:324, 03:326-03:334N,



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For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
 101.708-24u – without *Taq* polymerase

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Lot No.: **0V9**

Lot-specific information

				03:336-03:442, 03:444-03:572, 04:01:03, 04:02:16, 04:03:03, 04:09, 04:63, 04:75
95⁷	135 bp, 170 bp, 205 bp, 235 bp	430 bp	4	*03:132, 04:01:01-04:02:01:01, 04:02:01:04-04:104
96⁹	-	-	Negative control	

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

When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.

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

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

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

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

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases. In the presence of a specific amplification the intensity of the control band often decreases.

³The serological split of the DQB1*05:05-05:248, DQB1*06:06 to 06:07 alleles, the DQB1*06:10, 06:13, 06:15-06:24 and 06:27 to 06:370, the DQB1*02:04-02:171Q, the DQB1*03:07-03:09 and 03:11-03:428 alleles and the DQB1*04:03:01-04:77 alleles is not known. In this table we have used the expert-assigned serological grouping in Tissue Antigens (2009) 73:95-170, and also inferred the serological grouping from the naming of the sequence-defined allele.

⁴For several DQB1 alleles 1st and/or 3rd exon(s) and beyond, as well as intron nucleotide sequences, are not 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. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

⁵HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

⁶Primer mixes 89 and 90 have a tendency to give rise to primer oligomer formation.

⁷Primer mixes 91 to 95 may give rise to a lower yield of HLA-specific PCR product than the other DQ low resolution primer mixes.

⁸Primer mixes 93 and 94 may have tendencies of unspecific amplifications.

⁹Primer mix 96 contains a negative control, which will amplify the majority of HLA amplicons as well as the amplicons generated by the control primer pairs matching the human growth hormone gene. HLA-specific PCR product sizes range from 75 to 200 base pairs and the PCR product generated by the HGH positive control primer pair is 200 base pairs.

¹⁰The primers in this kit do not amplify the DQB1*02:218 and DQB1*02:234 alleles.

Abbreviations

w: might be weakly amplified.

?: nucleotide sequence information not available for the primer matching sequence.



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101.708-24u – without *Taq* polymerase

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Lot No.: 0V9

Lot-specific information

HLA-A LOW PRIMER SPECIFICATION

Well No.	1	2	3	4	5	6	7	8	9	10	11	12
Length of spec.	120	135	205	190	135	175	165	80	80	80	125	175
PCR product	145	175	235		200	205	200		200	175	165	225
	225	215							240		190	
		255										
		365										
		415										
Length of int.	800	800	1070	800	800	1070	800	800	800	1070	800	1070
pos. control ¹												
5'-primer(s) ²	98	48	359	98	176	98	98	257	98	301	103	98
	5'-CTT 3'	5'-gCT 3'	5'-gCA 3'	5'-CTA 3'	5'-gCA 3'	5'-CTC 3'	5'-CTA 3'	5'-Cgg 3'	5'-CTA 3'	5'-Cgg 3'	5'-CCT 3'	5'-CTT 3'
	103	78	363	413	368	368	102	259	261	302	415	414
	5'-CCT 3'	5'-TCT 3'	5'-ATA 3'	5'-CCg 3'	5'-gTT 3'	5'-gTT 3'	5'-ACA 3'	5'-AgA 3'	5'-AAC 3'	5'-ggA 3'	5'-ggT 3'	5'-CAg 3'
	123	106	363				413	261		385	423	423
	5'-AgT 3'	5'-CCA 3'	5'-ATA 3'				5'-CCg 3'	5'-AAC 3'		5'-ggC 3'	5'-gCT 3'	5'-gCT 3'
	363	144						266				
	5'-ATA 3'	5'-gCA 3'						5'-ACg 3'				
	363											
	5'-ATg 3'											
3'-primer(s) ³	203	240	527	256	270	259	259	302	256	341	257	282
	5'-TCT 3'	5'-ggA 3'	5'-CCA 3'	5'-CTg 3'	5'-ACA 3'	5'-gTT 3'	5'-gTT 3'	5'-ggC 3'	5'-CCA 3'	5'-CgT 3'	5'-gCA 3'	5'-gAC 3'
	545	292	527	559	521	502	259	303	299	521	506	282
	5'-AgA 3'	5'-gTg 3'	5'-CCT 3'	5'-CCg 3'	5'-ggg 3'	5'-CTT 3'	5'-gTT 3'	5'-AgA 3'	5'-TCg 3'	5'-ggg 3'	5'-TgT 3'	5'-gAC 3'
			527		526	539	538		300		538	559
			5'-CCT 3'		5'-CCg 3'	5'-TCT 3'	5'-CCA 3'		5'-TTT 3'		5'-CCg 3'	5'-CCC 3'
			555		534				308		559	560
			5'-CCA 3'		5'-CgT 3'				5'-TCT 3'		5'-CTC 3'	5'-ACC 3'
			555								559	
			5'-gCA 3'								5'-CgT 3'	
											559	
											5'-CgC 3'	
											563	
											5'-CgA 3'	
Well No.	1	2	3	4	5	6	7	8	9	10	11	12



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For In Vitro Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

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Lot No.: 0V9

Lot-specific information

Well No.	13	14	15	16	17	18	19	20	21
Length of spec.	80	90	145	140	205	340	210	65	75
PCR product	115	135	240	180	390	375	240	240	155
	200	205	380	235				375	240
	240		410	260				545	495
	460								
Length of int. pos. control ¹	1070	1070	1070	1070	1070	800	800	800	800
5'-primer(s) ²	98	203	41	98	41	302	78	28	176
	5'-CAC 3'	5'-gAA 3'	5'-CTT 3'	5'-CTT 3'	5'-CTT 3'	5'-ggA 3'	5'-TCT 3'	5'-TCg 3'	5'-gCA 3'
	219	362	160	180	98	302	106	261	261
	5'-gCA 3'	5'-ggT 3'	5'-ACg 3'	5'-TTT 3'	5'-CAC 3'	5'-ggA 3'	5'-CCA 3'	5'-AAC 3'	5'-AAC 3'
	238	363	355	203		317	2 nd I	502	341
	5'-AgA 3'	5'-ATA 3'	5'-CCg 3'	5'-gAA 3'		5'-gCg 3'	5'-CCT 3'	5'-CCC 3'	5'-ggA 3'
	355	363		418			2 nd I		355
	5'-CCg 3'	5'-ATA 3'		5'-AgC 3'			5'-ggC 3'		5'-CCC 3'
	489	363							362
	5'-gCA 3'	5'-ATA 3'							5'-gAg 3'
		369							362
		5'-TAC 3'							5'-gAg 3'
3'-primer(s) ³	180	299	238	290	256	397	265	97	292
	5'-TCA 3'	5'-CCA 3'	5'-CCT 3'	5'-CAA 3'	5'-CCC 3'	5'-gAg 3'	5'-CCC 3'	5'-ggT 3'	5'-gTg 3'
	257	411	238	299	259		282	355	292
	5'-gCA 3'	5'-TCA 3'	5'-CCT 3'	5'-TCT 3'	5'-gTT 3'		5'-gAC 3'	5'-gAC 3'	5'-gTT 3'
	418	526	243	317	261		282	524	299
	5'-gTC 3'	5'-CCA 3'	5'-TCA 3'	5'-ggA 3'	5'-gTg 3'		5'-gAC 3'	5'-CAT 3'	5'-TCT 3'
	555		265	555	265		502		555
	5'-CCA 3'		5'-CCC 3'	5'-CCA 3'	5'-CCC 3'		5'-CTT 3'		5'-CCA 3'
			282		265		506		
			5'-gAC 3'		5'-CCC 3'		5'-TgT 3'		
			555		265				
			5'-CCA 3'		5'-CCA 3'				
Well No.	13	14	15	16	17	18	19	20	21

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

²The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

³The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.



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For In Vitro Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

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“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

HLA-B LOW PRIMER SPECIFICATION

Well No.	22	23	24	25	26	27	28	29	30	31	32	33
Length of spec.	285	215	140	105	185	190	290	165	165	180	90	195
PCR product			235	140	235			225	190		105	
				260				285	390		195	
								330				
Length of int. pos. control ¹	1070	1070	1070	800	800	800	1070	1070	1070	800	1070	1070
5'-primer(s) ²	355	97	209	103	103	103	45	45	45	420	206	142
	5'-TCA 3'	5'-TCg 3'	5'-ggC 3'	5'-CCg 3'	5'-CCT 3'	5'-CCg 3'	5'-ggA 3'	5'-ggA 3'	5'-ggA 3'	5'-TTA 3'	5'-AgA 3'	5'-TCT 3'
	363		363	103	103	418		357	435		412	419
	5'-AgC 3'		5'-AgC 3'	5'-CCg 3'	5'-CCT 3'	5'-Agg 3'		5'-Tgg 3'	5'-AAA 3'		5'-ATA 3'	5'-gTC 3'
			5'-AgC 3'	5'-AgT 3'	5'-AAT 3'			5'-ATA 3'			5'-CCg 3'	
				363							416	
				5'-AgC 3'							420	
											5'-TTA 3'	
											420	
											5'-TTC 3'	
3'-primer(s) ³	603	272	309	167	246	246	165	206	266	559	256	301
	5'-gTg 3'	5'-Tgg 3'	5'-gTg 3'	5'-ACA 3'	5'-TAT 3'	5'-TAT 3'	5'-Tgg 3'	5'-CCT 3'	5'-TCC 3'	5'-CTC 3'	5'-CCC 3'	5'-gTC 3'
	605	272	312	193	246	572		538	559		272	301
	5'-gCT 3'	5'-TgA 3'	5'-gCC 3'	5'-CgT 3'	5'-TAT 3'	5'-gCC 3'		5'-gTC 3'	5'-CAg 3'		5'-Tgg 3'	5'-gTC 3'
		272	559	193	559			603	583		572	570
		5'-TgT 3'	5'-CAg 3'	5'-CgT 3'	5'-CTC 3'			5'-gTg 3'	5'-gTg 3'		5'-gCg 3'	5'-CCg 3'
				463							572	
				5'-gCT 3'							5'-gCg 3'	
				583								
				5'-gTg 3'								
Well No.	22	23	24	25	26	27	28	29	30	31	32	33
Well No.	34	35	36	37	38	39	40	41	42	43	44	45
Length of spec.	105	115	80	105	140	55	210	170	110	395	160	180
PCR product	395	150		150		245					425	
	435					390						
						415						
Length of int. pos. control ¹	800	1070	1070	800	1070	1070	800	800	1070	1070	1070	1070
5'-primer(s) ²	45	161	167	349	206	45	142	407	246	44	44	355
	5'-ggA 3'	5'-Cgg 3'	5'-gCT 3'	5'-CTT 3'	5'-gAC 3'	5'-ggA 3'	5'-TCT 3'	5'-gg 3'	5'-gAA 3'	5'-ggC 3'	5'-ggC 3'	5'-TCA 3'
	540			355		368	368	409			357	363
	5'-gAC 3'			5'-TCA 3'		5'-gTT 3'	5'-gTC 3'	5'-ggC 3'			5'-Tgg 3'	5'-Agg 3'
						557		409				
						5'-ggA 3'		5'-ggC 3'				
								420				
								5'-TTA 3'				
3'-primer(s) ³	272	234	204	412	301	259	311	544	317	272	302	499
	5'-TgC 3'	5'-TCT 3'	5'-TCT 3'	5'-gTT 3'	5'-gCT 3'	5'-gTT 3'	5'-ggg 3'	5'-ggT 3'	5'-ggA 3'	5'-TgC 3'	5'-ggC 3'	5'-ggA 3'
	272	272		463	302	259	311		320		302	
	5'-TgT 3'	5'-TgA 3'		5'-gCT 3'	5'-ggC 3'	5'-gTT 3'	5'-ggg 3'		5'-AgT 3'		5'-ggT 3'	
	309	272			311	266	538				477	
	5'-ATC 3'	5'-Tgg 3'			5'-ggT 3'	5'-TCC 3'	5'-gTC 3'				5'-gCg 3'	
	605				312	272						
	5'-gCT 3'				5'-AgT 3'	5'-Tgg 3'						
						292						
						5'-gTA 3'						
						572						
						5'-gCg 3'						
Well No.	34	35	36	37	38	39	40	41	42	43	44	45



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For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

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“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

Well No.	46	47	48	49	50	51	52	53	54	55	56	57
Length of spec. PCR product	105	325	80	130	90	90	105	120	390	145	300	160
			115	280	410	175	145	210	430	210		370
			160				395					
			195				430					
			225									
			260									
Length of int. pos. control ¹	1070	800	1070	800	1070	1070	1070	800	1070	1070	1070	1070
5'-primer(s) ²	540 5'-gAC 3'	1 st I 5'-CAg 3'	355 5'-TCA 3'	209 5'-ggC 3'	41 5'-CTg 3'	209 5'-ggC 3'	48 5'-gCC 3'	357 5'-Tgg 3'	49 5'-CAg 3'	142 5'-TCA 3'	1 st I 5'-CAg 3'	15 5'-gCA 3'
			418 5'-Agg 3'	209 5'-ggg 3'	363 5'-AAT 3'	363 5'-AgC 3'	206 5'-gAA 3'			206 5'-gAA 3'		418 5'-Agg 3'
			499 5'-TCT 3'	355 5'-TCA 3'	368 5'-gTT 3'		259 5'-ggg 3'					
3'-primer(s) ³	603 5'-gTg 3'	282 5'-gCC 3'	538 5'-gTC 3'	299 5'-TCA 3'	282 5'-gCC 3'	259 5'-gTT 3'	272 5'-TgT 3'	435 5'-TCT 3'	272 5'-TgC 3'	311 5'-ggT 3'	259 5'-CTC 3'	207 5'-TCC 3'
	603 5'-gTg 3'		572 5'-gCA 3'	583 5'-gTg 3'	418 5'-gTC 3'	499 5'-ggA 3'	309 5'-ATC 3'	527 5'-CCT 3'	309 5'-ATC 3'		259 5'-CTC 3'	226 5'-CAC 3'
	605 5'-gCT 3'		572 5'-gCg 3'	605 5'-gCT 3'							262 5'-TgC 3'	538 5'-gTC 3'
			573 5'-AgT 3'									
Well No.	46	47	48	49	50	51	52	53	54	55	56	57

Well No.	58	59	60	61	62	63	64
Length of spec. PCR product	180	180	90	95	115	360	350
	210	205	150		150		
	240		415				
Length of int. pos. control ¹	1070	1070	800	1070	1070	1070	1070
5'-primer(s) ²	141 5'-ATT 3'	97 5'-TCg 3'	15 5'-gCA 3'	206 5'-gAC 3'	165 5'-ACC 3'	1 st I 5'-CAg 3'	1 st I 5'-CAg 3'
	362 5'-gAC 3'	420 5'-TTA 3'	209 5'-ggC 3'		463 5'-TgA 3'		
	362 5'-ggT 3'		209 5'-ggA 3'				
	420 5'-TTA 3'		449 5'-CCC 3'				
3'-primer(s) ³	311 5'-ggT 3'	259 5'-gTT 3'	256 5'-CCC 3'	259 5'-gTT 3'	272 5'-TgC 3'	317 5'-ggA 3'	311 5'-ggT 3'
	559 5'-CgT 3'	559 5'-CAg 3'	259 5'-CTT 3'		538 5'-CCA 3'	320 5'-AgT 3'	
			263 5'-gTT 3'				
			559 5'-CgT 3'				
Well No.	58	59	60	61	62	63	64



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For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
 101.708-24u – without *Taq* polymerase

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Lot No.: **0V9**

Lot-specific information

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 22 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

²The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

³The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.



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For *In Vitro* Diagnostic Use
 MA123 v02 SSP PI Template
 Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
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“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

DR LOW PRIMER SPECIFICATION

Well No.	65	66	67	68	69	70	71	72	73	74	75	76
Length of spec.	210	200	200	210	125	75	85	100	180	120	85	70
PCR product	235		230		230	210	210	175	205	215	100	175
	260								230	250	135	
											165	
											195	
Length of int.	515	430	430	430	515	430	430	430	430	515	430	430
pos. control ¹												
5'-primer(s) ²	11(119) 5'-gCT 3'	14(129) 5'-gAA 3'	12(121) 5'-CTg 3'	11(119) 5'-gCT 3'	13(125) 5'-gTC 3'	13(125) 5'-gTC 3'	13(125) 5'-gTC 3'	13(124) 5'-AAC 3'	11(118) 5'-AgA 3'	16(133) 5'-gTT 3'	26(165) 5'-TAT 3'	26(164) 5'-gTA 3'
	14(129) 5'-gAA 3'		13(126) 5'-Agg 3'	13(126) 5'-Agg 3'	47(227) 5'-gTT 3'	16(133) 5'-gTT 3'		13(125) 5'-ATA 3'	14(127) 5'-ATA 3'	16(133) 5'-gTT 3'	37(196) 5'-AgA 3'	31(178) 5'-gCg 3'
			13(126) 5'-AAg 3'	13(126) 5'-AAg 3'				13(125) 5'-gTC 3'	14(127) 5'-ATA 3'	16(133) 5'-gCT 3'	58(261) 5'-gAg 3'	
			13(126) 5'-AgA 3'						14(127) 5'-gTA 3'	60(265) 5'-AgT 3'		
									16(133) 5'-gTT 3'			
									29(174) 5'-AgA 3'			
									31(178) 5'-gCg 3'			
3'-primer(s) ³	67(286) 5'-gAg 3'	67(286) 5'-gAT 3'	67(286) 5'-gAT 3'	67(286) 5'-gAA 3'	73(305) 5'-ggC 3'	26(164) 5'-ggT 3'	28(171) 5'-CTC 3'	33(184) 5'-gTg 3'	71(298) 5'-CTC 3'	74(307) 5'-CAg 3'	57(257) 5'-CgA 3'	38(200) 5'-gCg 3'
	67(286) 5'-gAg 3'	67(286) 5'-gAA 3'	67(286) 5'-gAT 3'	67(286) 5'-gAg 3'	73(305) 5'-ggC 3'	67(286) 5'-gAT 3'	70(295) 5'-CTg 3'	58(260) 5'-Cgg 3'	73(305) 5'-ggC 3'	86(344) 5'-CAC 3'	73(305) 5'-ggC 3'	72(303) 5'-gCA 3'
	67(286) 5'-gAT 3'	67(286) 5'-gAA 3'	67(286) 5'-gAT 3'	67(286) 5'-gAg 3'	73(305) 5'-ggC 3'	71(299) 5'-gCT 3'			77(317) 5'-AAT 3'		78(319) 5'-CAC 3'	74(307) 5'-CgC 3'
	70(297) 5'-CTg 3'		70(295) 5'-CTg 3'	70(296) 5'-TgT 3'	73(305) 5'-ggC 3'				78(319) 5'-CAC 3'			
	71(299) 5'-gCg 3'		70(295) 5'-Tg 3'	72(302) 5'-Cgg 3'	73(306) 5'-Tgg 3'				78(319) 5'-CAA 3'			
	73(305) 5'-ggC 3'		70(296) 5'-TCC 3'		74(308) 5'-CCC 3'				78(319) 5'-CgC 3'			
	77(317) 5'-AgT 3'		71(299) 5'-gCg 3'		75(310) 5'-CAA 3'							
	86(344) 5'-CCA 3'		71(299) 5'-gCT 3'		77(317) 5'-AgT 3'							
			72(301) 5'-Cg 3'									
			73(305) 5'-ggC 3'									
			77(317) 5'-AgT 3'									
Well No.	65	66	67	68	69	70	71	72	73	74	75	76



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For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

Well No.	77	78	79	80	81	82	83	84	85	86	87
Length of spec.	100	90	210	195	175	75	110	110	80	130	175
PCR product	170	110	235	225	240	100	140	150	110	215	215
						140	170	180	160		
						170		220	190		
						195			240		
						240					
Length of int.	430	430	430	430	430	430	430	430	515	430	430
pos. control ¹											
5'-primer(s) ²	13(125) 5'-gTC 3'	13(124) 5'-Cgg 3'	10(116) 5'-gCT 3'	10(116) 5'-gCT 3'	13(125) 5'-gTC 3'	5(101) 5'-CAA 3'	26(164) 5'-gTA 3'	13(125) 5'-gTC 3'	10(116) 5'-gCT 3'	28(170) 5'-gAT 3'	9(112) 5'-TgC 3'
	16(133) 5'-gTC 3'	16(133) 5'-gTT 3'	12(122) 5'-TAT 3'	12(122) 5'-TAT 3'	13(125) 5'-gTg 3'	37(197) 5'-gTT 3'	34(189) 5'-Cag 3'	34(189) 5'-Cag 3'	10(116) 5'-gCT 3'	28(170) 5'-gAg 3'	13(125) 5'-gTA 3'
	38(200) 5'-CgT 3'		13(125) 5'-gTC 3'	12(123) 5'-ACA 3'	114(429) 5'-CTg 3'	37(197) 5'-gTA 3'	34(189) 5'-Cag 3'	37(196) 5'-AgC 3'	11(119) 5'-gCT 3'	105(401) 5'-AAA 3'	
				13(125) 5'-gTC 3'			34(189) 5'-CCg 3'		38(199) 5'-TCC 3'		
				13(125) 5'-gTg 3'							
				16(133) 5'-gTC 3'							
				16(133) 5'-gTT 3'							
3'-primer(s) ³	58(260) 5'-CCT 3'	28(171) 5'-CTC 3'	70(295) 5'-gTC 3'	67(286) 5'-gAA 3'	58(260) 5'-Cgg 3'	48(230) 5'-CCT 3'	57(257) 5'-Cag 3'	57(257) 5'-Cag 3'	51(239) 5'-CCC 3'	81(328) 5'-gTA 3'	57(256) 5'-gTC 3'
	58(260) 5'-CCT 3'	30(175) 5'-gTg 3'	71(299) 5'-gCT 3'	71(298) 5'-CTC 3'	58(260) 5'-Cag 3'	57(257) 5'-Cag 3'	70(295) 5'-CTg 3'	60(265) 5'-gTg 3'	57(256) 5'-gCT 3'	87(346) 5'-CTC 3'	57(256) 5'-gCT 3'
	58(260) 5'-CCT 3'	38(199) 5'-Cag 3'	71(299) 5'-ACT 3'	71(298) 5'-CgC 3'	181(630) 5'-CTT 3'	71(298) 5'-CgC 3'	70(296) 5'-TCC 3'	70(296) 5'-TCC 3'	60(266) 5'-Agg 3'	87(346) 5'-CTT 3'	57(258) 5'-gCg 3'
	58(261) 5'-TCT 3'		74(307) 5'-CgT 3'					74(307) 5'-Cag 3'	77(317) 5'-AAT 3'	135(490) 5'-gCT 3'	57(258) 5'-gCT 3'
			78(319) 5'-CAC 3'								58(260) 5'-CCT 3'
											70(296) 5'-TgT 3'
Well No.	77	78	79	80	81	82	83	84	85	86	87

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 65 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

²The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

³The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.



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For In Vitro Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

DQ LOW PRIMER SPECIFICATION

Well No.	88	89	90	91	92	93	94	95
Length of spec.	135	65	210	130	130	135	85	135
PCR product	195	110		220	220		145	170
	230	135					185	205
		160						235
		185						
		220						
		270						
Length of int.	515	515	430	515	515	515	515	430
pos. control ¹								
5'-primer(s) ²	25(170) 5'-gCT 3'	9(122) 5'-gTT 3'	28(178) 5'-TgC 3'	26(173) 5'-TTA 3'	28(179) 5'-gAC 3'	26(173) 5'-TCT 3'	38(210) 5'-gCA 3'	9(122) 5'-gTT 3'
	26(172) 5'-ggA 3'	9(122) 5'-gCT 3'	30(184) 5'-gAg 3'		28(179) 5'-gAC 3'		48(240) 5'-CgC 3'	21(159) 5'-ACC 3'
	26(172) 5'-ggC 3'	25(169) 5'-TgT 3'	30(185) 5'-AAg 3'		28(179) 5'-gAC 3'		55(260) 5'-gCC 3'	23(164) 5'-gCT 3'
	26(173) 5'-ggg 3'	26(172) 5'-ATC 3'	30(185) 5'-AAA 3'				71(309) 5'-ACC 3'	38(210) 5'-gCg 3'
	26(173) 5'-ggA 3'	26(173) 5'-TTA 3'					71(309) 5'-AgC 3'	
	26(173) 5'-ggg 3'	26(173) 5'-TCT 3'						
	26(173) 5'-gTg 3'	48(240) 5'-CgC 3'						
3'-primer(s) ³	57(266) 5'-CAA 3'	48(240) 5'-gCg 3'	86(353) 5'-gCT 3'	55(260) 5'-gCg 3'	57(266) 5'-Cgg 3'	57(266) 5'-CgT 3'	86(353) 5'-gCT 3'	70(304) 5'-CTC 3'
	77(327) 5'-ACT 3'	57(266) 5'-CAA 3'		86(353) 5'-gCT 3'	57(266) 5'-CAG 3'	57(266) 5'-CgT 3'	86(354) 5'-AgT 3'	77(327) 5'-ACg 3'
	87(356) 5'-ggT 3'	86(353) 5'-ACg 3'		86(354) 5'-AgT 3'	57(266) 5'-Cgg 3'		86(354) 5'-Agg 3'	
	87(356) 5'-ggA 3'	86(353) 5'-ACC 3'			87(356) 5'-ggg 3'		87(355) 5'-gAC 3'	
	87(356) 5'-ggT 3'	86(354) 5'-TAT 3'					87(356) 5'-ggC 3'	
	89(361) 5'-CCT 3'	86(354) 5'-AAA 3'					88(358) 5'-gCC 3'	
		86(354) 5'-AAg 3'						
		86(354) 5'-AAT 3'						
Well No.	88	89	90	91	92	93	94	95

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 88 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

²The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

³The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.



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For In Vitro Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase

101.708-24u – without *Taq* polymerase

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Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET																					
HLA-A low resolution primer set ²																					
					Prod. No.:	Well															
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
						202461201	202461202	202461203	202461204	202461206	202461207	202461208	202461209	202461210	202461211	202461212	202461213	202461214	202461215	202461216	202460217
	IHC cell line ¹		A*	A*																	
1	9001	SA	*24:02			-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*02:01			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011	E4181324	*01:01			+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*30:01			-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
5	9009	KAS011	*01:01			+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*02:01	*26:03		-	+	-	-	-	-	+	-	-	+	-	+	-	-	-	-
7	9020	QBL	*26:01			-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-
8	9025	DEU	*31:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
9	9026	YAR	*26:01			-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-
10	9107	LKT3	*24:02			-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*29:02			-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
12	9052	DBB	*02:01			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*02:01			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*31:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
15	9075	DKB	*24:02			-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*29:02			-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
17	9282	CTM3953540	*03:01	*80:01		-	-	+	-	+	-	-	-	-	-	-	+	-	-	-	-
18	9257	32367	*33:03	*74:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038	BM16	*02:01			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*02:01			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*02:17			-	+	-	-	-	W	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*02:01			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124	IHL	*02:01	*34:01		-	+	-	-	-	-	+	-	-	+	+	-	-	-	-	-
24	9035	JBUSH	*32:01			-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+
25	9049	IBW9	*33:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*02:05			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*24:10	*29:01		-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-
28	9320	BEL5GB	*02:01	*29:02		-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-
29	9050	MOU	*29:02			-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
30	9021	RSH	*30:01	*68:02		-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-
31	9019	DUCAF	*30:02			-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
32	9297	HAG	*02:01			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098	MT14B	*31:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
34	9104	DHIF	*31:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
35	9302	SSTO	*32:01			-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+
36	9024	KT17	*02:06	*11:01		-	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-
37	9065	HHKB	*03:01			-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
38	9099	LZL	*02:17			-	+	-	-	-	W	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*01:01	*03:01		+	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-
40	9134	WHONP199	*02:07	*30:01		-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-
41	9055	H0301	*03:01			-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
42	9066	TAB089	*02:07			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*02:06	*02:07		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057	TEM	*66:01			-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-
45	9239	SHJO	*23:01	*24:02		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
46	9013	SCHU	*03:01			-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
47	9045	TUBO	*02:16	*03:01		-	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-
48	9303	TER-ND	*02:01	*11:01		-	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-



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For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase

101.708-24u – without *Taq* polymerase

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Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET									
HLA-A low resolution primer set ²									
					Well				
					17	18	19	20	21
					Prod. No.:	202461218	202461219	202461220	202461221
						20260223			
	IHWC cell line ¹	A*	A*						
1	9001 SA	*24:02			-	-	-	-	-
2	9280 LK707	*02:01			-	-	-	-	-
3	9011 E4181324	*01:01			-	-	-	-	-
4	9275 GU373	*30:01			-	-	-	-	-
5	9009 KAS011	*01:01			-	-	-	-	-
6	9353 SM	*02:01	*26:03		-	-	-	-	+
7	9020 QBL	*26:01			-	-	-	-	-
8	9025 DEU	*31:01			-	-	-	-	-
9	9026 YAR	*26:01			-	-	-	-	-
10	9107 LKT3	*24:02			-	-	-	-	-
11	9051 PITOUT	*29:02			-	-	-	-	-
12	9052 DBB	*02:01			-	-	-	-	-
13	9004 JESTHOM	*02:01			-	-	-	-	-
14	9071 OLGA	*31:01			-	-	-	-	-
15	9075 DKB	*24:02			-	-	-	-	-
16	9037 SWEIG007	*29:02			-	-	-	-	-
17	9282 CTM3953540	*03:01	*80:01		-	-	-	-	+
18	9257 32367	*33:03	*74:01		+	+	-	-	-
19	9038 BM16	*02:01			-	-	-	-	-
20	9059 SLE005	*02:01			-	-	-	-	-
21	9064 AMALA	*02:17			-	-	-	+	-
22	9056 KOSE	*02:01			-	-	-	-	-
23	9124 IHL	*02:01	*34:01		-	-	-	-	-
24	9035 JBUSH	*32:01			-	-	-	-	-
25	9049 IBW9	*33:01			+	-	-	-	-
26	9285 WT49	*02:05			-	-	-	-	-
27	9191 CH1007	*24:10	*29:01		-	-	-	-	-
28	9320 BEL5GB	*02:01	*29:02		-	-	-	-	-
29	9050 MOU	*29:02			-	-	-	-	-
30	9021 RSH	*30:01	*68:02		-	-	-	-	-
31	9019 DUCAF	*30:02			-	-	-	-	-
32	9297 HAG	*02:01			-	-	-	-	-
33	9098 MT14B	*31:01			-	-	-	-	-
34	9104 DHIF	*31:01			-	-	-	-	-
35	9302 SSTS	*32:01			-	-	-	-	-
36	9024 KT17	*02:06	*11:01		-	-	-	-	-
37	9065 HHKB	*03:01			-	-	-	-	-
38	9099 LZL	*02:17			-	-	-	-	-
39	9315 CML	*01:01	*03:01		-	-	-	-	-
40	9134 WHONP199	*02:07	*30:01		-	-	-	-	-
41	9055 H0301	*03:01			-	-	-	-	-
42	9066 TAB089	*02:07			-	-	-	-	-
43	9076 T7526	*02:06	*02:07		-	-	-	-	-
44	9057 TEM	*66:01			-	-	-	-	-
45	9239 SHJO	*23:01	*24:02		-	-	-	-	-
46	9013 SCHU	*03:01			-	-	-	-	-
47	9045 TUBO	*02:16	*03:01		-	-	-	-	-
48	9303 TER-ND	*02:01	*11:01		-	-	-	-	-



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Date: March 2025, Rev. No: 00

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101.708-24u – without *Taq* polymerase

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Lot No.: **0V9**

Lot-specific information

¹The provided cell line HLA specificities are retrieved from the <http://www.ihwg.org/hla> web site. The specificity of an individual cell line may thus be subject to change.

²The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.

The specificities of the primers in primer solutions 4, 6, 7, 11, 13 to 16 and 19 to 21 were tested by separately adding one or more 3'-primers, and one, two or three 5'-primers, respectively. One or more 5'-primers in primer solutions 1, 2, 8 and 12 were tested by separately adding one or two 3'-primers. One or more 3'-primers in primer solutions 3 and 17 were tested by separately adding one or two 5'-primers. In primer solutions 2, 3, 8, 10, 11, 14, 15 and 19 one or two 5'-primers were not possible to be tested, and in primer solutions 3, 5, 7, 8, 9, 11, 12, 15 and 17 one or two 3'-primers were not possible to be tested.



0197

For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET																					
HLA-B low resolution SSP kit ²																					
					Prod. No.:	Well															
						22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
						202461348	202461802	202461303	202461304	202461305	202461306	202461307	202461308	202461309	202461310	202461311	202461313	202461314	202461315	202461316	202461317
	IHCW cell line ¹		B*																		
1	9001	SA	*07:02			+	-	-	-	-	-	-	-	-	-	-	-				
2	9280	LK707	*52:01	*73:01		-	-	-	-	-	-	-	-	+	-	-	-				
3	9011	E4181324	*52:01			-	-	-	-	-	-	-	-	+	-	-	-				
4	9275	GU373	*15:10	*53:01		-	-	-	-	-	-	-	+	-	-	+	-				
5	9009	KAS011	*37:01			-	-	-	-	-	-	-	-	-	-	+	-				
6	9353	SM	*39:01	*51:01		-	-	-	-	+	-	-	-	+	-	-	-				
7	9020	QBL	*18:01			-	-	-	-	-	-	-	-	-	-	+	-				
8	9025	DEU	*35:01			-	-	-	-	-	-	-	-	-	-	-	+				
9	9026	YAR	*38:01			-	-	-	-	+	-	-	-	-	-	-	-				
10	9107	LKT3	*54:01			-	-	-	-	-	-	-	-	-	-	-	-				
11	9051	PITOUT	*44:03			-	-	-	-	+	-	-	-	-	-	-	+				
12	9052	DBB	*57:01			-	-	-	-	-	-	-	-	-	-	-	+				
13	9004	JESTHOM	*27:05			-	-	-	-	+	-	-	-	-	-	+	-				
14	9071	OLGA	*15:01	*15:20		-	-	-	-	-	-	+	-	-	-	-	+				
15	9075	DKB	*40:01			-	-	-	-	+	-	-	-	-	-	-	-				
16	9037	SWEIG007	*40:02			-	-	-	-	-	-	-	-	-	-	-	-				
17	9282	CTM3953540	*08:01	*55:01		+	+	-	-	-	-	-	+	-	-	-	-				
18	9257	32367	*14:01	*56:01		-	-	-	-	+	+	-	-	-	-	-	-				
19	9038	BM16	*18:01			-	-	-	-	-	-	-	-	-	-	+	-				
20	9059	SLE005	*40:01			-	-	-	-	+	-	-	-	-	-	-	-				
21	9064	AMALA	*15:01			-	-	-	-	-	-	+	-	-	-	-	-				
22	9056	KOSE	*35:03			-	-	-	-	-	-	-	-	-	-	-	+				
23	9124	IHL	*40:02	*56:02		-	-	-	-	-	-	-	-	-	-	-	-				
24	9035	JBUSH	*38:01			-	-	-	-	+	-	-	-	-	-	-	-				
25	9049	IBW9	*14:02			-	-	-	-	+	-	+	-	-	-	-	-				
26	9285	WT49	*58:01			-	-	-	-	-	-	-	-	-	-	-	+				
27	9191	CH1007	*07:05	*51:01		+	-	-	-	-	-	-	-	+	-	-	-				
28	9320	BEL5GB	*44:02	*44:03		-	-	-	-	+	-	-	-	-	-	-	+				
29	9050	MOU	*44:03			-	-	-	-	+	-	-	-	-	-	-	+				
30	9021	RSH	*42:01			+	-	-	-	-	-	-	+	-	-	-	-				
31	9019	DUCAF	*18:01			-	-	-	-	-	-	-	-	-	-	+	-				
32	9297	HAG	*41:02			+	-	-	-	+	-	-	+	-	-	-	-				
33	9098	MT14B	*40:01			-	-	-	-	+	-	-	-	-	-	-	-				
34	9104	DHIF	*38:01			-	-	-	-	-	+	-	-	-	-	-	-				
35	9302	SSTO	*44:02			-	-	-	-	+	-	-	-	-	-	-	+				
36	9024	KT17	*15:01	*35:01		-	-	-	-	-	-	-	+	-	-	-	+				
37	9065	HHKB	*07:02			+	-	-	-	-	-	-	-	-	-	-	-				
38	9099	LZL	*15:01			-	-	-	-	-	-	+	-	-	-	-	-				
39	9315	CML	*08:01	*27:05		+	+	-	-	+	-	-	+	-	-	-	+				
40	9134	WHONP199	*13:02	*46:01		-	-	+	+	-	-	+	-	-	+	-	-				
41	9055	H0301	*14:02			-	-	-	-	+	-	+	-	-	-	-	-				
42	9066	TAB089	*46:01			-	-	-	-	-	-	+	-	-	-	-	-				
43	9076	T7526	*46:01			-	-	-	-	-	-	+	-	-	-	-	-				
44	9057	TEM	*38:01			-	-	-	-	-	+	-	-	-	-	-	-				
45	9239	SHJO	*42:01	*50:01		+	-	-	-	+	-	-	-	+	-	-	-				
46	9013	SCHU	*07:02			+	-	-	-	-	-	-	-	-	-	-	-				
47	9045	TUBO	*51:01			-	-	-	-	-	-	-	-	+	-	-	-				
48	9303	TER-ND	*35:01	*44:03		-	-	-	-	+	-	-	-	-	-	-	-				



0197

For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase

101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-B low resolution SSP kit ²																				
					Well															
					38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
				Prod. No.:	202461318	202461319	202461320	202461321	202461322	202461323	202461324	202461325	202461327	202461328	202461329	202461331	202461332	202461333	202461334	202461835
	IHCW cell line ¹		B*																	
1	9001	SA	*07:02		-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-
2	9280	LK707	*52:01	*73:01	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	+
3	9011	E4181324	*52:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
4	9275	GU373	*15:10	*53:01	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*37:01		-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-
6	9353	SM	*39:01	*51:01	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+
7	9020	QBL	*18:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*35:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026	YAR	*38:01		-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*54:01		-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
11	9051	PITOUT	*44:03		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
12	9052	DBB	*57:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*27:05		-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
14	9071	OLGA	*15:01	*15:20	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*40:01		-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*40:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953540	*08:01	*55:01	-	-	-	-	-	-	+	-	+	+	-	-	+	-	-	+
18	9257	32367	*14:01	*56:01	-	-	-	-	-	+	+	-	-	+	-	-	+	-	-	-
19	9038	BM16	*18:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*40:01		-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
21	9064	AMALA	*15:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*35:03		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124	IHL	*40:02	*56:02	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
24	9035	JBUSH	*38:01		-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*14:02		-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
26	9285	WT49	*58:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*07:05	*51:01	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	+
28	9320	BEL5GB	*44:02	*44:03	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
29	9050	MOU	*44:03		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
30	9021	RSH	*42:01		-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-
31	9019	DUCAF	*18:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*41:02		-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
33	9098	MT14B	*40:01		-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
34	9104	DHIF	*38:01		-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*44:02		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
36	9024	KT17	*15:01	*35:01	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065	HHKB	*07:02		-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-
38	9099	LZL	*15:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*08:01	*27:05	-	-	-	-	-	-	+	-	+	+	-	-	+	-	-	-
40	9134	WHONP199	*13:02	*46:01	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
41	9055	H0301	*14:02		-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*46:01		-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
43	9076	T7526	*46:01		-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
44	9057	TEM	*38:01		-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*42:01	*50:01	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	+
46	9013	SCHU	*07:02		-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-
47	9045	TUBO	*51:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
48	9303	TER-ND	*35:01	*44:03	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-

101.708-24 – including *Taq* polymerase

101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET																		
HLA-B low resolution SSP kit ²																		
					Prod. No.:	Well												
						54	55	56	57	58	59	60	61	62	63	64		
						202461336	202461337	202461338	202461339	202461340	202461341	202461342	202461344	202461345	202461346	202461347		
	IHWC cell line ¹		B*															
1	9001	SA	*07:02			-	-	-	-	-	-	-	-	-	-	-	-	+
2	9280	LK707	*52:01	*73:01		+	+	+	-	-	-	-	-	-	+	+	+	+
3	9011	E4181324	*52:01			+	-	+	-	-	-	-	-	-	-	+	-	-
4	9275	GU373	*15:10	*53:01		+	-	-	-	-	-	-	+	-	-	+	+	+
5	9009	KAS011	*37:01			-	-	+	-	-	-	-	-	-	-	+	-	-
6	9353	SM	*39:01	*51:01		+	-	-	-	-	-	-	+	-	-	+	+	+
7	9020	QBL	*18:01			-	-	-	-	-	-	-	+	-	-	-	+	+
8	9025	DEU	*35:01			-	-	-	-	-	-	-	+	-	-	-	+	+
9	9026	YAR	*38:01			-	-	-	-	-	-	-	-	-	-	+	-	-
10	9107	LKT3	*54:01			-	-	-	+	+	-	-	-	-	-	-	-	+
11	9051	PITOUT	*44:03			-	-	+	-	-	-	-	-	-	-	+	-	-
12	9052	DBB	*57:01			+	-	-	-	-	-	+	-	-	-	+	-	-
13	9004	JESTHOM	*27:05			-	-	+	-	-	-	-	-	-	-	+	-	-
14	9071	OLGA	*15:01	*15:20		-	-	+	-	-	-	-	-	+	-	-	+	+
15	9075	DKB	*40:01			-	+	+	-	-	-	-	-	-	-	-	+	+
16	9037	SWEIG007	*40:02			-	+	+	-	-	-	-	-	-	-	-	+	+
17	9282	CTM3953540	*08:01	*55:01		-	-	-	-	+	-	-	-	-	-	-	-	+
18	9257	32367	*14:01	*56:01		-	-	-	-	-	+	-	-	-	-	-	-	+
19	9038	BM16	*18:01			-	-	-	-	-	-	-	+	-	-	-	+	+
20	9059	SLE005	*40:01			-	+	+	-	-	-	-	-	-	-	-	-	+
21	9064	AMALA	*15:01			-	-	+	-	-	-	-	-	+	-	-	+	+
22	9056	KOSE	*35:03			-	-	-	-	-	-	-	+	-	-	-	+	+
23	9124	IHL	*40:02	*56:02		-	+	+	-	-	+	-	-	-	-	-	+	-
24	9035	JBUSH	*38:01			-	-	-	-	-	-	-	-	-	-	+	-	-
25	9049	IBW9	*14:02			-	-	-	-	-	-	-	-	-	-	-	-	+
26	9285	WT49	*58:01			+	-	-	-	-	-	-	-	-	-	+	-	-
27	9191	CH1007	*07:05	*51:01		+	-	-	-	-	-	-	+	-	-	+	+	+
28	9320	BEL5GB	*44:02	*44:03		-	-	+	+	-	-	-	-	-	-	+	-	-
29	9050	MOU	*44:03			-	-	+	-	-	-	-	-	-	-	+	-	-
30	9021	RSH	*42:01			-	-	-	-	-	-	-	-	-	-	-	-	+
31	9019	DUCAF	*18:01			-	-	-	-	-	-	-	+	-	-	-	+	+
32	9297	HAG	*41:02			-	+	+	-	-	-	-	-	-	-	-	-	+
33	9098	MT14B	*40:01			-	+	+	-	-	-	-	-	-	-	-	-	+
34	9104	DHIF	*38:01			-	-	-	-	-	-	-	-	-	-	+	-	-
35	9302	SSTO	*44:02			-	-	+	+	-	-	-	-	-	-	+	-	-
36	9024	KT17	*15:01	*35:01		-	-	+	-	-	-	-	+	+	-	-	+	+
37	9065	HHKB	*07:02			-	-	-	-	-	-	-	-	-	-	-	-	+
38	9099	LZL	*15:01			-	-	+	-	-	-	-	-	+	-	-	+	+
39	9315	CML	*08:01	*27:05		-	-	+	-	-	-	-	-	-	-	+	+	+
40	9134	WHONP199	*13:02	*46:01		-	-	+	-	-	-	-	-	+	+	+	+	+
41	9055	H0301	*14:02			-	-	-	-	-	-	-	-	-	-	-	-	+
42	9066	TAB089	*46:01			-	-	-	-	-	-	-	-	+	-	-	+	+
43	9076	T7526	*46:01			-	-	-	-	-	-	-	-	+	-	-	+	+
44	9057	TEM	*38:01			-	-	-	-	-	-	-	-	-	-	+	-	-
45	9239	SHJO	*42:01	*50:01		-	+	+	-	-	+	-	-	-	-	-	-	+
46	9013	SCHU	*07:02			-	-	-	-	-	-	-	-	-	-	-	-	+
47	9045	TUBO	*51:01			+	-	-	-	-	-	-	+	-	-	+	-	-
48	9303	TER-ND	*35:01	*44:03		-	-	+	-	-	-	-	+	-	-	+	+	+



0197

For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

¹The provided cell line HLA specificities are retrieved from the <http://www.ihwg.org/hla> web site. The specificity of an individual cell line may thus be subject to change.

²The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.

The specificities of the primers in primer solutions 24, 27, 32, 34, 39, 48, 49, 58, 59 and 60 were tested by separately adding one or two additional 3'-primers, and one or two additional 5'-primers respectively. One or more 3'-primers in primer solutions 23, 25, 29, 33, 35, 38, 52 and 54 were tested by separately adding one or two additional 5'-primers. One or more 5'-primers in primer solutions 22, 41 and 45 were tested by separately adding one additional 3'-primer.

In primer mixes 32, 37, 41, 49 and 60 one 5'-primer was not possible to be tested, and in primer mixes 24, 42, 46, 48, 56, 57, 60 and 63 one or two 3'-primers were not possible to be tested.



0197

For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase

101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET																				
DR low resolution primer set ³																				
					Well ²															
					65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
				Prod. No.:	202461701	202461702	202461703	202461704	202461705	202461706	202461707	202461708	202461709	202461710	202461711	202461712	202461713	202461714	202461715	202461716
	IHCW cell line ¹			DRB1																
1	9001	SA	*01:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*15:02	*04:05	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
3	9011	E4181324	*15:02		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*16:01		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*04:07	*08:03	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-
7	9020	QBL	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*04:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
9	9026	YAR	*04:02		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
10	9107	LKT3	*04:05		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
11	9051	PITOUT	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
12	9052	DBB	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
13	9004	JESTHOM	*01:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*08:02		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+
15	9075	DKB	*09:01		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
16	9037	SWEIG007	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
17	9282	CTM3953540	*03:01	*13:01	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+
18	9257	32367	*09:01	*11:01	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+
19	9038	BM16	*12:01		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
20	9059	SLE005	*13:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
21	9064	AMALA	*14:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*13:02	*14:01	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
23	9124	IHL	*08:03	*14:14	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
24	9035	JBUSH	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
25	9049	IBW9	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
26	9285	WT49	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*04:05	*10:01	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
28	9320	BEL5GB	*04:16	*07:01	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
29	9050	MOU	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
30	9021	RSH	*03:02		-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
31	9019	DUCAF	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*13:03		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-
33	9098	MT14B	*04:04		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
34	9104	DHIF	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
35	9302	SSTO	*04:03		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
36	9024	KT17	*04:03	*04:06	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
37	9065	HHKB	*13:01		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
38	9099	LZL	*14:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
39	9315	CML	*03:01	*04:01	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
40	9134	WHONP199	*07:01	*09:01	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
41	9055	H0301	*13:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
42	9066	TAB089	*08:03		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
43	9076	T7526	*09:01		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
44	9057	TEM	*14:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
46	9013	SCHU	*15:01		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*11:04	*12:01	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
48	9303	TER-ND	*01:03		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase

101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET									
DR low resolution primer set ³									
					Well ²				
					81	82	83	84	85 86 87
					202462117	202461718	202461719	202461720	202460429B 202461730 202461731
					Prod. No.:				
IHCW cell line ¹			DRB1						
1	9001	SA	*01:01		-	-	-	-	-
2	9280	LK707	*15:02	*04:05	-	-	-	-	+
3	9011	E4181324	*15:02		-	-	-	-	+
4	9275	GU373	*03:01		+	-	-	-	+
5	9009	KAS011	*16:01		-	-	-	-	+
6	9353	SM	*04:07	*08:03	-	-	-	-	+
7	9020	QBL	*03:01		+	-	-	-	+
8	9025	DEU	*04:01		-	-	-	-	+
9	9026	YAR	*04:02		-	-	-	-	+
10	9107	LKT3	*04:05		-	-	-	-	+
11	9051	PITOUT	*07:01		-	-	-	-	+
12	9052	DBB	*07:01		-	+	-	-	+
13	9004	JESTHOM	*01:01		-	-	-	-	-
14	9071	OLGA	*08:02		-	-	-	-	-
15	9075	DKB	*09:01		-	-	+	-	+
16	9037	SWEIG007	*11:01		-	-	-	-	+
17	9282	CTM3953540	*03:01	*13:01	+	-	-	-	+
18	9257	32367	*09:01	*11:01	-	-	+	-	+
19	9038	BM16	*12:01		-	-	-	-	+
20	9059	SLE005	*13:02		+	-	-	-	+
21	9064	AMALA	*14:02		+	-	+	-	+
22	9056	KOSE	*13:02	*14:01	+	+	+	+	+
23	9124	IHL	*08:03	*14:14	+	-	+	+	+
24	9035	JBUSH	*11:01		-	-	-	-	+
25	9049	IBW9	*07:01		-	-	-	-	+
26	9285	WT49	*03:01		+	-	-	-	+
27	9191	CH1007	*04:05	*10:01	-	-	-	-	+
28	9320	BEL5GB	*04:16	*07:01	-	-	-	-	+
29	9050	MOU	*07:01		-	-	-	-	+
30	9021	RSH	*03:02		+	-	-	-	+
31	9019	DUCAF	*03:01		+	-	-	-	+
32	9297	HAG	*13:03		+	-	-	-	+
33	9098	MT14B	*04:04		-	-	-	-	+
34	9104	DHIF	*11:01		-	-	-	-	+
35	9302	SSTO	*04:03		-	-	-	-	+
36	9024	KT17	*04:03	*04:06	-	-	-	-	+
37	9065	HHKB	*13:01		+	-	-	-	+
38	9099	LZL	*14:02		+	-	+	-	+
39	9315	CML	*03:01	*04:01	+	-	-	-	+
40	9134	WHONP199	*07:01	*09:01	-	-	+	-	+
41	9055	H0301	*13:02		+	-	-	-	+
42	9066	TAB089	*08:03		-	-	-	-	-
43	9076	T7526	*09:01		-	-	+	-	+
44	9057	TEM	*14:01		-	+	+	+	+
45	9239	SHJO	*07:01		-	-	-	-	+
46	9013	SCHU	*15:01		-	-	-	-	+
47	9045	TUBO	*11:04	*12:01	-	-	-	-	+
48	9303	TER-ND	*01:03		-	-	-	-	-



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For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

¹The provided cell line HLA specificities are retrieved from the <http://www.ihwg.org/hla> web site. The specificity of an individual cell line may thus be subject to change.

²The DRB4*01:03:01:02N allele is amplified by primer mix 82 in the DBB/9052 cell line.

³The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.

The specificities of the primers in primer solutions 73, 75, 79 and 82 were tested by separately adding one 3'-primer, and one or three 5'-primers respectively.

One or more 5'-primers in primer solutions 68, 70, 76 and 80 were tested by separately adding one 3'-primer. One or more 3'-primers in primer solutions 65 to 67, 69, 84 and 87 were tested by separately adding one or more 5'-primers.

One or more 5'-primers in primer solutions 67, 68, 72 to 74, 77 to 81, 83, 84 and 86 were not possible to be tested. One or more 3'-primers in primer solutions 65 to 70, 73, 77, 79, 86 and 87 were not possible to be tested.



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For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

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“Instructions for Use” (IFU)

Lot No.: **0V9**

Lot-specific information

CELL LINE VALIDATION SHEET															
DQ low resolution primer set ²															
					Prod. No.:	Well									
						88	89	90	91	92	93	94	95		
						202460501	202460502	202460503	202460504	202460505	202460506	202460507	202460508		
	IHWC cell line ¹		DQB1												
1	9001	SA	*05:01	*02:02	+	-	-	-	-	-	-	-	-	-	
2	9280	LK707	*06:01		-	+	+	-	-	-	-	-	-	-	
3	9011	E4181324	*06:01		-	+	-	-	-	-	-	-	-	-	
4	9275	GU373	*02:01	*06:01	-	-	+	-	-	-	-	-	-	-	
5	9009	KAS011	*05:02		+	-	-	-	-	-	-	-	-	-	
6	9353	SM	*03:02		-	+	-	-	+	-	+	-	-	-	
7	9020	QBL	*02:01		-	-	+	-	-	-	-	-	-	-	
8	9025	DEU	*03:01		-	-	-	+	-	-	+	-	-	-	
9	9026	YAR	*03:02		-	-	-	-	+	-	+	-	-	-	
10	9107	LKT3	*04:01		-	-	-	-	-	-	-	-	+	+	
11	9051	PITOUT	*02:02		-	-	+	-	-	-	-	-	-	-	
12	9052	DBB	*03:03		-	-	-	-	-	+	+	-	-	-	
13	9004	JESTHOM	*05:01		+	-	-	-	-	-	-	-	-	-	
14	9071	OLGA	*04:02		-	-	-	-	-	-	-	-	+	+	
15	9075	DKB	*03:03		-	-	-	-	-	+	+	-	-	-	
16	9037	SWEIG007	*03:01		-	-	-	+	-	-	+	-	-	-	
17	9282	CTM 3953540	*02:01	*06:03	-	+	+	-	-	-	-	-	-	-	
18	9257	32367	*06:02	*02:02	-	+	+	-	-	-	-	-	-	-	
19	9038	BM16	*03:01		-	-	-	+	-	-	+	-	-	-	
20	9059	SLE005	*06:04		-	+	-	-	-	-	-	-	-	-	
21	9064	AMALA	*03:01	*06:04	-	-	-	+	-	-	+	-	-	-	
22	9056	KOSE	*05:03		+	+	-	-	-	-	-	-	-	-	-
23	9124	IHL	*05:03		+	+	-	-	-	-	-	-	-	-	-
24	9035	JBUSH	*03:01	*05:01	-	-	-	+	-	-	+	-	-	-	
25	9049	IBW9	*02:02		-	-	+	-	-	-	-	-	-	-	-
26	9285	WT49	*02:01		-	-	+	-	-	-	-	-	-	-	-
27	9191	CH1007	*04:01		+	-	-	-	-	-	-	-	-	+	+
28	9320	BEL5GB	*02:02		*03:01	-	-	+	+	-	-	+	-	-	-
29	9050	MOU	*02:02		-	-	+	-	-	-	-	-	-	-	-
30	9021	RSH	*04:02		-	-	-	-	-	-	-	-	-	+	+
31	9019	DUCAF	*02:01		-	-	+	-	-	-	-	-	-	-	
32	9297	HAG	*03:01	*06:01	-	-	-	+	-	-	+	-	-	-	
33	9098	MT14B	*03:02		-	-	-	-	+	-	+	-	-	-	-
34	9104	DHIF	*03:01		-	-	-	+	-	-	+	-	-	-	-
35	9302	SSTO	*03:05		-	-	-	-	+	-	+	-	-	-	
36	9024	KT17	*03:02		-	-	-	-	+	-	+	-	-	-	
37	9065	HHKB	*06:03		-	+	-	-	-	-	-	-	-	-	
38	9099	LZL	*03:01	*03:01	-	-	-	+	-	-	+	-	-	-	
39	9315	CML	*02:01		-	-	+	+	-	-	+	-	-	-	-
40	9134	WHONP199	*02:02		*03:03	-	-	+	-	-	+	+	-	-	-
41	9055	H0301	*06:09		-	+	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*06:01		-	+	-	-	-	-	-	-	-	-	
43	9076	T7526	*03:03		-	-	-	-	-	+	+	-	-	-	
44	9057	TEM	*05:03		+	-	-	-	-	-	-	-	-	-	
45	9239	SHJO	*02:02		-	-	+	-	-	-	-	-	-	-	
46	9013	SCHU	*06:02		-	+	-	-	-	-	-	-	-	-	
47	9045	TUBO	*03:01		-	-	-	+	-	-	+	-	-	-	
48	9303	TER-ND	*05:01		+	-	-	-	-	-	-	-	-	-	



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For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

¹The provided cell line HLA specificities are retrieved from the <http://www.ihwg.org/hla> web site. The specificity of an individual cell line may thus be subject to change.

²The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.

The specificities of the primers in primer solution 89 were tested by separately adding one 3'-primer, and one 5'-primer accordingly.

One 5'-primer in primer solution 94 was tested by separately adding one additional 3'-primer.

One or more 3'-primers in primer solutions 88 and 93 were tested by separately adding two additional 5'-primers.

In primer solutions 88 to 90, 92 and 94 one or more 5'-primers were not possible to be tested.

In primer solutions 88, 89, 91, 92 and 94 one or more 3'-primers were not possible to be tested.



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For *In Vitro* Diagnostic Use
MA123 v02 SSP PI Template
Date: March 2025, Rev. No: 00

101.708-24 – including *Taq* polymerase
101.708-24u – without *Taq* polymerase

Visit www.caredx.com for
“Instructions for Use” (IFU)

Lot No.: 0V9

Lot-specific information

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Tel: +46-8-508 939 00

Fax: +46-8-717 88 18

E-mail: orders-se@caredx.com

Web page: www.caredx.com

CareDx Lab Solutions Inc., 901 S. Bolmar St., Suite R, West Chester, PA 19382

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Fax: 610-344-7989

E-mail: orders-us@caredx.com

Web page: www.caredx.com

For information on CareDx distributors worldwide, contact **CareDx AB**.



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For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

Date: March 2025, Rev. No: 00