

101.601-24/12 – including *Taq* pol., IFU-01
101.601-24u/12u – without *Taq* pol., IFU-02

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“Instructions for Use” (IFU)

Lot No.: **4N6**

Lot-specific information

Olerup SSP® HLA-C low resolution

Product number:	101.601-24/12 – including <i>Taq</i> pol. 101.601-24u/12u – without <i>Taq</i> pol.
Lot number:	4N6
Expiry date:	2025-08-01
Number of tests:	24 tests – Product No. 101.601-24/24u 12 tests – Product No. 101.601-12/12u
Number of wells per test:	31 + 1
Storage - pre-aliquoted primers:	dark at -20°C
- PCR Master Mix:	-20°C
- Adhesive PCR seals	RT
- Product Insert	RT

This Product Description is only valid for Lot No. 4N6.

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-C LOW RESOLUTION LOT (9L9)

The HLA-C low resolution primer set, specificity and interpretation tables have been updated for the HLA-C alleles described since the previous *Olerup SSP®* HLA-C low resolution lot was made (**Lot No. 9L9**). The kit design is based on IMGT/HLA database 3.44.0.

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

Well	5'-primer	3'-primer	rationale
3	Added		5'-primer added for the C*03:02:10 allele.
15	-	Added	3'-primer added for improved yield of the C*02:02:01 allele.
20	-	Added	3'-primer added for the C*14:02:32 allele.



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Well **32** 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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PRODUCT DESCRIPTION

HLA-C-low resolution SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for grouping the HLA-C*01:02 to C*18:14 alleles into the groups C*01:xx to C*18:xx.

PLATE LAYOUT

Each test consists of 32 PCR reactions in a 32 well cut PCR plate.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	NC

The 32 well cut PCR plate is marked with ‘HLA-C low’ in silver/gray ink.

Well No. 1 is marked with the Lot No. ‘4N6’.

Wells 1 to 31 – HLA-C low resolution primers.

Well 32 – 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.

Please note: When removing each 32 well PCR plate, make sure that the remaining plates stay sealed. Use a scalpel or a similar instrument to carefully cut the foil between the plates.

INTERPRETATION

Only HLA-C alleles will be amplified by the HLA-C low resolution typing kit, except that a few HLA-A and HLA-B alleles will be amplified by some primer mixes. For further details see Specificity Table.

UNIQUELY IDENTIFIED ALLELES

All the HLA-C alleles, i.e. **C*01:02 to C*18:14**, recognized by the HLA Nomenclature Committee in April 2021^{1,2} will be amplified by the primers in the HLA-C low resolution SSP kit^{3,4}. The HLA-C alleles will be grouped into the C*01xx to C*18xx groups.

¹HLA-C alleles listed on the IMGT/HLA web page 2021-April-20, release 3.44.0, 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>.



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³The following alleles give rise to identical amplification patterns with the HLA-C low resolution primer set. These alleles are separated by the HLA-A low primer set and by the HLA-B low primer set respectively.

Alleles

C*03:16, 03:536, B*46:77
C*12:222, B*67:02:01:01-67:02:01:02
C*14:06, 14:09, 14:28:01-14:28:02, 14:63, 14:105Q, A*29:86, A*30:62, A*31:187, A*33:63, B*08:249, B*18:64, B*35:183, B*35:252, B*35:502, B*39:114, B*39:140, B*40:138, B*41:59

⁴The following alleles give rise to identical amplification patterns with the HLA-C low resolution primer set. These alleles can be separated by the respective high-resolution primer sets.

Alleles

C*01:169:02, C*03:94



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SPECIFICITY TABLE

HLA-C low resolution SSP typing

Specificities and sizes of the PCR products of the 31+1 primer mixes used for
HLA-C low resolution SSP typing

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified HLA class I alleles ³
1¹²	95 bp, 150 bp, 210 bp	800 bp	*01:02:01:01-01:211N, 01:213, 03:58, 03:86, 03:94, 03:416, 04:37, 04:71, 04:436N, 05:85, 05:107, 05:200, 05:241, 06:204, 07:316, 07:338, 07:579, 12:215, 14:45, 14:58, 15:102, 15:104, B*15:539, B*39:76, B*54:18
2^{4,14}	130 bp, 200 bp, 270 bp, 300 bp	800 bp	*01:10, 01:43, 02:02:01-02:02:03, 02:02:06-02:40:02, 02:42-02:57, 02:59-02:196, 02:198-02:203, 04:32, 04:77, 04:265, 04:357, 04:406, 05:105, 05:200, 05:206, 06:08, 07:101, 07:148, 07:161, 07:583, 08:31, 08:185, 12:119, 12:198, 14:25, 15:42, 15:111, 15:201, 16:29, 16:50, 17:01:01-02-17:06, 17:08-17:16:02, 17:18-17:22, 17:24-17:32, 17:34-17:59, 18:03
3¹⁵	265 bp	800 bp	*01:48, 01:169:02, 02:02:01-02:02:03, 02:02:06-02:40:02, 02:42-02:86, 02:88-02:106, 02:108-02:133, 02:135N-02:151, 02:153-02:166, 02:168-02:203, 03:02:01-03:02:25, 03:04:01-01-03:10, 03:14-03:17:02, 03:19, 03:23N-03:29, 03:32-03:38:02, 03:40:01-03:42:02, 03:44-03:48, 03:51, 03:54, 03:57:01-03:57:02, 03:60, 03:63-03:64:01, 03:65, 03:70-03:74, 03:77-03:78, 03:80:01-03:80:02, 03:82, 03:84, 03:87:01-03:87:02, 03:89-03:95, 03:98, 03:100-03:101, 03:104-03:111, 03:113:01-03:115:02, 03:117-03:118, 03:121N, 03:123, 03:125, 03:128-03:131, 03:134-03:140:01:02, 03:143, 03:145-03:149, 03:153-03:157, 03:159, 03:162-03:164, 03:166, 03:169Q-03:170, 03:172-03:174, 03:178-03:181, 03:183-03:184:02, 03:186:01-03:186:02, 03:190-03:191, 03:193-03:194, 03:197-03:201N, 03:208N-03:213, 03:215-03:216, 03:218-03:219, 03:221-03:222, 03:224N-03:226, 03:232-03:236, 03:238-03:240, 03:244Q-03:250, 03:252, 03:255-03:261, 03:263:01-03:266, 03:269-03:270, 03:277N-03:283, 03:286-03:287:02, 03:292-03:294, 03:296:01-03:303, 03:305-03:306, 03:309-03:311, 03:313-03:315, 03:317-03:318N, 03:322-03:323N, 03:326, 03:328-03:335, 03:337-03:338, 03:340, 03:342-03:343, 03:347-03:350, 03:353-03:355, 03:358-03:359, 03:361-03:362, 03:365-03:366N, 03:368-03:369, 03:371, 03:373, 03:376, 03:379, 03:381-03:382, 03:384-03:388, 03:390-03:394, 03:396:01N-03:397, 03:399-03:412, 03:415, 03:417, 03:419-03:420, 03:423-03:426, 03:429, 03:431, 03:434-03:435, 03:437, 03:439, 03:441-03:443, 03:445N-03:446N, 03:448Q-03:449N, 03:452-03:456, 03:458-03:459, 03:462N-03:470N, 03:473, 03:475, 03:478, 03:480, 03:482-03:489, 03:491:01-03:494, 03:496-03:502, 03:505, 03:508N, 03:510N-03:513, 03:518, 03:521-03:523, 03:525-03:526, 03:531N-03:532, 03:536, 03:538-03:539, 03:543-03:544, 03:546-03:549, 03:552-03:555, 03:558, 03:561, 04:03:01-01-04:03:07, 04:06:01-04:06:03, 04:16, 04:80, 04:107, 04:147, 04:160:01-04:160:02, 04:171, 04:190, 04:256, 04:286, 04:294, 04:299, 04:335, 04:337, 04:351:01-04:351:02, 04:357, 04:363, 04:381, 04:383, 04:393, 04:400, 04:402, 05:58:01-05:58:04,



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4^{5,12}	85 bp, 170 bp, 210 bp, 275 bp	1070 bp	*01:67, 01:122, 01:131, 03:02:01-03:03:51, 03:03:53-03:04:06, 03:04:08-03:11:02, 03:13:01:01-03:15, 03:17:01-03:40:04, 03:42:01-03:57:02, 03:59-03:79, 03:80:02-03:85, 03:87:01-03:93, 03:95-03:98, 03:100-03:112, 03:114-03:150, 03:152-03:164, 03:166-03:250, 03:252-03:259, 03:261-03:266, 03:268-03:285, 03:287:01-03:292, 03:294-03:383, 03:385-03:434, 03:436-03:450, 03:452-03:511N, 03:513-03:533, 03:537-03:539, 03:541-03:561, 04:201:02, 04:212, 07:133:01, 07:242, 07:330:01, 07:748, 15:218, B*15:96, B*44:274
5	280 bp	800 bp	*03:03:01:01-03:03:20, 03:03:22-03:03:50, 03:03:52-03:03:61, 03:11:01-03:11:02, 03:13:01:01-03:13:02, 03:18:02-03:18:03, 03:20N-03:22Q, 03:30-03:31, 03:43:01-03:43:02, 03:49-03:50, 03:52-03:53, 03:55-03:56, 03:58-03:59, 03:61-03:62, 03:66, 03:67 ^w , 03:68-03:69, 03:75-03:76, 03:79, 03:81, 03:83, 03:85-03:86, 03:88, 03:96-03:97, 03:102-03:103, 03:112, 03:116:01-03:116:02, 03:119:01-03:120, 03:122, 03:124, 03:126-03:127, 03:132-03:133, 03:141-03:142, 03:150-03:152, 03:158, 03:160-03:161, 03:165:01-03:165:02, 03:167-03:168, 03:171, 03:175-03:177, 03:185, 03:187-03:189N, 03:192, 03:196, 03:202-03:207, 03:214, 03:217, 03:220, 03:223, 03:227-03:230, 03:237, 03:241-03:243, 03:251, 03:253-03:254, 03:262, 03:267-03:268, 03:271-03:276, 03:284-03:285, 03:288-03:291, 03:295 ^w , 03:304, 03:307-03:308, 03:312, 03:316N, 03:319-03:321, 03:324-03:325, 03:327, 03:336, 03:339, 03:341, 03:345-03:346, 03:351-03:352, 03:356-03:357, 03:360, 03:363N-03:364, 03:367, 03:370, 03:372:01-03:372:02, 03:374-03:375, 03:377N-03:378, 03:380N, 03:383, 03:389, 03:395, 03:398, 03:413-03:414, 03:416, 03:418, 03:421N-03:422, 03:427-03:428, 03:430, 03:432N-03:433, 03:436, 03:438, 03:440, 03:444N, 03:447N, 03:450-03:451, 03:457, 03:460-03:461, 03:471-03:472, 03:474, 03:476-03:477, 03:479, 03:481, 03:490, 03:495, 03:503, 03:506-03:507, 03:509N, 03:514-03:517, 03:519-03:520, 03:524, 03:527-03:529, 03:533-03:535, 03:537, 03:540-03:542, 03:545, 03:550-03:551, 03:556, 03:559-03:560N, 15:12, 15:144
6¹⁵	135 bp, 330 bp	800 bp	*02:02:01-02:02:03, 02:02:06-02:02:12, 02:02:14-02:02:25, 02:02:27-02:02:28, 02:02:30-02:20, 02:22-02:25Q, 02:27:01-02:38:02N, 02:40:01-02:40:02, 02:42-02:44, 02:46-02:86, 02:88-02:100, 02:101 ^w , 02:102-02:106, 02:108-02:133, 02:135N-02:151, 02:153-02:166, 02:168-02:188, 02:190, 02:192N-02:203, 03:231, 04:01:01:01-04:01:01:29, 04:01:01:31-04:01:27, 04:01:29-04:01:60, 04:01:62, 04:01:64, 04:01:66-04:01:139, 04:03:01:01-04:07:01, 04:08-04:15:03, 04:17-04:20, 04:23-04:41, 04:43-04:102, 04:104-04:139, 04:141-04:195, 04:197-04:212, 04:214-04:219, 04:221-04:235,



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7⁶	165 bp, 390 bp, 445 bp	1070 bp	*02:94, 04:129, 05:01:01:01-05:01:64, 05:03-05:255, 06:05, 06:67, 08:10, 12:21, 12:33, 15:107, 15:178, 16:40, 16:53, 16:110, 16:113, 17:05
8^{12,13}	125 bp, 355 bp	800 bp	*01:02:49, 01:90, 01:101-01:102, 01:113, 01:136, 01:145:01N, 01:146:01-01:146:02, 02:06:01-02:06:02, 02:23, 02:36:01-02:36:02, 02:47, 02:111, 04:23, 04:100, 04:108, 04:178, 04:335, 04:422, 05:01:56, 05:22:01-05:22:02, 05:132, 05:215, 05:241, 05:252, 06:02:01:01-06:02:01:60, 06:02:03-06:02:38, 06:02:40-06:02:71, 06:02:73-06:16N, 06:18-06:31, 06:33-06:76:01, 06:77-06:93, 06:96-06:98, 06:100-06:132:01, 06:133-06:179, 06:181-06:235, 06:237-06:243, 06:245-06:325, 08:83, 08:108, 08:113, 08:207, 12:02:11, 12:02:35, 12:03:09, 12:03:26, 12:03:66, 12:15, 12:113, 12:208, 12:298, 12:309, 14:26, 15:02:01:01-15:03, 15:05:01:01-15:05:07, 15:05:09-15:13:02, 15:15-15:19, 15:21-15:23:02, 15:26-15:29, 15:31-15:39, 15:41-15:64, 15:67-15:75, 15:78:01-15:101, 15:103-15:189N, 15:191-15:210, 15:212-15:221, 15:223-15:233, 16:01:16, 16:20, 16:109, 16:169, B*58:02:01:01-58:02:02
9⁷	245 bp, 425 bp	800 bp	*07:01:01:01-07:01:02:10, 07:01:04-07:33N, 07:35-07:294, 07:296-07:944, 12:181, 14:121
10^{8,12,15}	110 bp, 165 bp, 390 bp	800 bp	*01:43, 02:87, 03:280, 03:530, 07:101, 07:148, 07:161, 07:583, 08:01:01:01-08:63, 08:65-08:225Q, 12:127, 12:203, 16:139
11	155 bp, 255 bp, 340 bp	1070 bp	*01:14, 01:59, 01:118, 01:186, 02:02:01-02:02:03, 02:02:06-02:40:02, 02:42-02:86, 02:88-02:203, 03:07:01:01-03:07:02, 03:15, 03:45, 03:130, 03:140:01:01-03:140:01:02, 03:163, 03:231, 03:243, 03:248, 03:268, 03:297, 03:308, 03:461, 04:01:01:01-04:01:01:29, 04:01:01:31-04:01:139, 04:03:01:01-04:20, 04:23-04:442, 05:01:01:01-05:01:64, 05:03-05:128N, 05:130-05:255, 06:02:01:01-06:02:01:60, 06:02:03-06:02:11, 06:02:13-06:02:64, 06:02:66-06:10, 06:12-06:51, 06:53:01-06:121, 06:123, 06:125-06:146, 06:148-06:216, 06:218-06:247, 06:249-06:251, 06:253-06:279, 06:281N-06:325, 07:07, 07:09, 07:49, 07:53, 07:76:01-07:76:02, 07:125:01-07:125:02, 07:210, 07:216, 07:238, 07:247, 07:315, 07:328, 07:356, 07:403, 07:406, 07:531, 07:598, 07:932, 08:10, 12:04:01-12:05:02, 12:09, 12:21, 12:33, 12:41, 12:54, 12:60, 12:146, 12:188, 12:194, 14:04, 14:12, 14:49, 14:64, 14:77, 14:90, 14:108, 15:02:01:01-15:05:07, 15:05:09-15:05:10, 15:05:13-15:06:03, 15:08:01-15:13:02, 15:15-15:19, 15:22-15:24, 15:26-15:42, 15:44:01-15:70, 15:72-15:115N, 15:117-15:143, 15:145N-15:233, 16:01:01:01-16:02:19, 16:06-16:09, 16:11-16:28, 16:30N-16:32, 16:34, 16:36-16:39:02, 16:41, 16:43-16:44, 16:46-16:52, 16:54, 16:56-16:60, 16:62-16:65, 16:69-16:77N, 16:79-16:81, 16:83-16:108, 16:111-16:123N, 16:125-16:148, 16:151-16:168, 16:170-16:181, 16:183-16:184, 17:01:01:02-17:21, 17:23-17:59, 18:01:01:01-18:14, A*24:174, B*57:129
12^{9,12,13}	100 bp, 155 bp, 220 bp	800 bp	*01:02:18, 01:04, 01:21, 02:02:44, 06:02:38, 06:76:02, 07:940, 12:02:01-12:02:13, 12:02:16-12:02:18, 12:02:20-12:02:29, 12:02:31, 12:02:33, 12:02:35-12:02:36, 12:02:38-12:02:39, 12:02:41-12:03:01:42, 12:03:03-12:03:07, 12:03:09-12:03:15,



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13^{12,13}	120 bp, 250 bp	800 bp	*01:21, 02:12, 02:49, 02:55:01-02:55:02, 02:115, 04:01:01:01-04:01:01:29, 04:01:01:31-04:01:139, 04:03:01:01-04:07:01, 04:08-04:09N, 04:12-04:20, 04:23-04:35:02, 04:37-04:54:02, 04:56-04:152, 04:154-04:168, 04:170N-04:191N, 04:193, 04:195-04:209, 04:211-04:213, 04:216-04:226, 04:228-04:248, 04:250-04:277, 04:279N ^w , 04:280-04:298, 04:300N-04:346, 04:348-04:413, 04:415-04:442, 05:42, 05:46:01:01-05:46:01:02, 05:112, 06:02:72, 06:76:02, 07:01:74, 07:02:09, 07:125:01-07:125:02, 07:356, 07:531, 07:583, 07:723, 08:05, 08:21, 08:25, 08:137, 12:02:01-12:02:10, 12:02:12-12:02:27, 12:02:28 ^w , 12:02:30-12:03:03, 12:03:05-12:03:08, 12:03:10-12:03:12, 12:03:13 ^w , 12:03:14-12:03:23, 12:03:24 ^w , 12:03:25-12:03:33, 12:03:35-12:03:72, 12:04:02:01-12:04:02:02, 12:06-12:08, 12:10:01-12:16:01, 12:17-12:20, 12:22-12:32, 12:34-12:48, 12:50-12:97, 12:99:01-12:122, 12:124-12:187, 12:189-12:194, 12:195:02, 12:196-12:298, 12:300, 12:302-12:342Q, 14:90, 15:03, 15:16, 15:25, 15:75, 16:01:01:01-16:02:19, 16:06-16:28, 16:30N-16:32, 16:34, 16:36-16:39:02, 16:41, 16:43-16:47, 16:49-16:52, 16:54, 16:56-16:60, 16:62-16:65, 16:67, 16:69-16:77N, 16:79-16:81, 16:83-16:87, 16:89N-16:90, 16:92-16:102, 16:104-16:108, 16:111-16:123N, 16:125-16:139, 16:141-16:148, 16:151-16:181, 16:183-16:184, 17:01:04, B*67:02:01:01-67:02:01:02
14¹⁶	160 bp, 215 bp	800 bp	*01:04, 01:09:01-01:09:02, 01:160, 02:05:01-02:05:03, 02:17, 04:42:01-04:42:02, 04:220, 04:360, 06:02:01:01-06:02:01:60, 06:02:03-06:02:15, 06:02:17-06:02:42, 06:02:44-06:03:02, 06:07-06:13, 06:15-06:34:02, 06:36-06:39, 06:41-06:71, 06:73-06:78, 06:80, 06:82-06:100, 06:102:01-06:122, 06:124-06:126, 06:128N-06:135, 06:137-06:142, 06:145-06:152N, 06:154-06:196, 06:198-06:202, 06:205-06:263N, 06:265-06:270, 06:272-06:303, 06:305-06:316N, 06:318-06:325, 07:31:01-07:31:02, 07:125:01-07:125:02, 07:177, 07:356, 07:514, 07:531, 12:03:01:01-12:03:46, 12:03:48-12:07, 12:11-12:13:01:02, 12:15, 12:19, 12:23, 12:25-12:26, 12:28-12:29, 12:31:01-12:35, 12:37-12:39N, 12:42Q-12:43, 12:45-12:48, 12:50-12:55, 12:57:01-12:63, 12:65-12:66, 12:70-12:71, 12:75-12:79, 12:81-12:82, 12:87-12:95, 12:97-12:102, 12:107-12:111, 12:113, 12:115-12:116, 12:119-12:122, 12:125, 12:129, 12:131, 12:133, 12:135, 12:138-12:141, 12:143-12:144, 12:147, 12:149-12:150, 12:152, 12:154, 12:156-12:160, 12:163, 12:165, 12:167, 12:170-12:174, 12:176, 12:178, 12:180, 12:182, 12:184-12:187, 12:189-12:192, 12:194-12:195:03, 12:197, 12:199, 12:201-12:203, 12:205-12:206, 12:209-12:211, 12:213, 12:215-12:216, 12:218, 12:220, 12:223, 12:225, 12:227, 12:229-12:230, 12:232N, 12:235, 12:237-12:238, 12:242, 12:244-12:246, 12:248-12:249, 12:253-12:254, 12:256-12:257, 12:259-12:260:02, 12:262, 12:264-12:267, 12:269, 12:271-12:274:01N, 12:276-12:278, 12:282-12:284, 12:286, 12:288-12:293, 12:295N, 12:297, 12:300-12:302, 12:305-12:306, 12:310-12:314, 12:316-12:326, 12:328, 12:330N-12:334, 12:337, 12:339-12:342Q, 14:15-14:16, 14:87, 16:04:01:01-16:04:01:03, 16:04:03-16:04:05,



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15¹⁴	130 bp, 255 bp	800 bp	*01:02:68, 01:02:71, 02:02:01-02:02:03, 02:02:06-02:13, 02:15-02:26:03, 02:28-02:40:02, 02:42-02:64, 02:66-02:86, 02:88-02:106, 02:108-02:114, 02:116-02:130, 02:132-02:163, 02:165N-02:186, 02:188-02:203, 03:07:01-03:07:02, 03:10, 03:15, 03:29, 03:45, 03:163, 03:268, 03:297, 03:302, 03:450, 03:461, 04:03:01-04:03:07, 04:06:01-04:06:03, 04:16, 04:37, 04:80, 04:103:01-04:103:02, 04:107, 04:147, 04:160:01-04:160:02, 04:171, 04:190, 04:256, 04:286, 04:294, 04:299, 04:335, 04:337, 04:351:01-04:351:02, 04:357, 04:363, 04:381, 04:393, 04:400, 04:402, 05:01:01-05:01:64, 05:03-05:19, 05:21-05:42, 05:44:01-05:77, 05:79-05:112, 05:114-05:155, 05:157-05:199, 05:201, 05:203-05:255, 06:03:01-06:03:02, 06:76:01-06:76:02, 06:132:01-06:132:02, 08:10, 12:04:01-12:05:02, 12:09, 12:21, 12:33, 12:41, 12:60, 12:72, 12:135, 12:146, 12:154, 14:45, 15:02:01-01-15:05:07, 15:05:09-15:06:03, 15:08:01-15:13:02, 15:15-15:19, 15:21-15:22, 15:24, 15:26-15:35, 15:37-15:42, 15:44:01-15:62, 15:64-15:84Q, 15:86-15:137, 15:139-15:143, 15:145N-15:157, 15:159-15:161, 15:163-15:180, 15:182-15:233, 16:02:01-01-16:02:19, 16:09, 16:12, 16:19, 16:25, 16:37, 16:46-16:48, 16:60, 16:63, 16:69-16:70, 16:74, 16:77N, 16:84, 16:88-16:91, 16:99, 16:101-16:104, 16:107-16:108, 16:115, 16:120-16:121, 16:123N, 16:132N-16:133, 16:136, 16:140, 16:143-16:145, 16:153, 16:155-16:156, 16:163, 16:166-16:167, 16:176, 16:179, 16:181, 16:184, 17:01:01-02-17:19, 17:21, 17:23-17:59, 18:09, B*15:277, B*15:430, B*35:222, B*42:22
16¹⁴	160 bp, 260 bp, 445 bp	1070 bp	*01:67, 01:122, 01:125, 01:177, 03:155, 03:231, 03:351, 03:557, 04:11, 04:29, 04:36, 04:55, 04:114, 04:172, 07:64, 07:293, 07:402, 07:519, 08:74, 08:95, 08:163, 08:183, 12:55, 12:269, 14:02:01-01-14:11, 14:13-14:48, 14:50-14:107, 14:109, 14:111-14:128, 16:40, 16:53, 16:110, 16:113, 16:150, 16:170, A*29:86, A*30:62, A*31:187, A*33:63, B*08:249, B*18:64, B*35:183, B*35:252, B*35:502, B*39:114, B*39:140, B*40:138, B*41:59
17^{10,12}	110 bp, 325 bp	800 bp	*01:90, 01:101-01:102, 01:113, 01:116, 02:06:01-02:06:02, 02:23, 02:36:01-02:36:02, 02:68, 03:81, 03:175, 03:199, 03:245, 03:317, 03:388, 04:108, 04:112, 04:169, 04:178, 04:422, 05:36, 05:132, 05:215, 05:238, 06:89, 06:224, 07:01:74, 07:123:01-07:123:02, 07:173, 07:294, 07:626, 07:725, 07:775, 07:850, 08:113, 12:08, 12:15, 12:81, 12:113, 12:188, 12:208, 12:282, 12:287, 12:309, 14:92, 15:02:01-01-15:05:07, 15:05:09-15:13:02, 15:15-15:19, 15:21-15:24, 15:26-15:233, 16:20, 16:64, 16:70, 16:87, 16:109, 16:169
18¹⁴	180 bp, 210 bp, 240 bp	1070 bp	*01:160, 02:13, 02:18, 02:33, 02:49, 02:75, 02:115, 02:180, 04:01:01-01-04:01:01:29, 04:01:01:31-04:01:22, 04:01:24-04:01:73, 04:01:74 ^w , 04:01:75-04:01:139, 04:03:01-01-04:07:01, 04:08-04:10, 04:12-04:20, 04:23-04:32, 04:34-04:106, 04:108-04:115N, 04:117-04:129, 04:131-04:166:01, 04:166:03-04:168, 04:170N-04:171, 04:173N-04:230, 04:232-04:282, 04:284-04:413, 04:415-04:442, 05:17, 05:25, 05:42, 05:55, 05:68, 05:76, 05:79, 05:115, 05:134, 05:143, 06:02:72, 06:05, 06:31, 06:76:02, 06:118, 07:01:74, 07:02:09, 07:31:01-07:31:02, 07:125:02, 07:154, 07:177, 07:514, 07:583, 08:01:01-01-08:01:17, 08:01:19-08:01:32, 08:03:01-01-08:03:04, 08:06, 08:08:01-08:11, 08:14, 08:16:01-08:16:02, 08:20-08:22:01:02,



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19¹³	225 bp, 250 bp, 290 bp	800 bp	*01:60, 02:40:01-02:40:02, 02:180, 04:58, 04:160:01-04:160:02, 04:368, 05:23, 05:62, 05:134, 05:143, 05:146, 05:151, 05:163, 05:206, 06:118, 08:07, 08:47, 08:104, 08:142, 08:185, 08:188, 12:14:01-12:14:02, 12:92, 12:176, 14:17, 15:25, 15:65, 15:201, 17:01:01:02-17:59
20¹⁴	215 bp, 420 bp	800 bp	*01:02:01:01-01:20, 01:22-01:211N, 01:213, 03:58, 03:86, 03:94, 04:37, 04:230, 04:263, 04:397, 04:432, 04:442, 05:16, 05:85, 05:107, 05:241, 06:05-06:06:01:02, 06:17, 06:31, 06:79N, 06:204, 06:271, 07:07, 07:09, 07:39-07:40, 07:49, 07:76:01-07:76:02, 07:177, 07:210, 07:238, 07:247, 07:315, 07:328, 07:335, 07:403, 07:406, 07:563, 07:598, 08:12:01:01-08:12:01:02, 12:09, 12:24, 12:176, 12:333, 14:02:01:01-14:05, 14:07N, 14:10-14:14, 14:17-14:27, 14:29-14:52, 14:55-14:62, 14:64-14:76, 14:78-14:86, 14:88-14:89, 14:91, 14:93N-14:104, 14:106-14:128, 15:102, 16:04:01:01-16:04:01:03, 16:04:03-16:04:05, 16:29, 16:33, 16:42, 16:53, 16:55, 16:61, 16:66, 16:68, 16:78, 16:82, 16:88, 16:91, 16:109, 16:124, 16:149-16:150, 16:182, 18:01:01:01-18:14, B*07:239, B*14:03, B*58:02:02
21	325 bp, 380 bp	1070 bp	*01:03:01-01:03:02, 01:24, 01:34, 01:49:01-01:50, 01:55, 01:78, 01:131, 01:176, 02:22, 02:62, 02:118, 02:197, 03:03:01-01:03:04:89, 03:06:01-03:11:02, 03:14, 03:18:01-03:24, 03:26:01-03:26:02, 03:28-03:32, 03:34, 03:37:01-03:59, 03:61-03:70, 03:72-03:83, 03:85, 03:87:01-03:88, 03:90-03:93, 03:96, 03:98, 03:100-03:107, 03:109, 03:111-03:120, 03:122-03:131, 03:133-03:134, 03:136-03:138, 03:140:01:01-03:145, 03:147-03:153, 03:155-03:166, 03:168, 03:170-03:176, 03:179-03:189N, 03:191-03:193, 03:195-03:196, 03:202-03:215, 03:217-03:220, 03:223, 03:227-03:237, 03:239-03:244Q, 03:246-03:247, 03:250-03:257, 03:259-03:261, 03:262?, 03:263:01-03:263:03, 03:265N-03:270, 03:272-03:291, 03:293-03:295, 03:297, 03:303-03:314, 03:316N-03:325, 03:327-03:328, 03:331, 03:333-03:334, 03:336-03:337, 03:339-03:348, 03:351-03:364, 03:366N-03:370, 03:372:01-03:372:02, 03:374-03:385, 03:387-03:390, 03:392N-03:401, 03:404:01:01-03:405, 03:408-03:410, 03:413-03:424N, 03:426-03:428, 03:430, 03:432N-03:448Q, 03:450-03:451, 03:453-03:463N, 03:465-03:467, 03:469-03:472, 03:476-03:481, 03:483-03:488, 03:490-03:492, 03:495-03:496, 03:498-03:504, 03:506-03:531N, 03:533-03:535, 03:537-03:543, 03:545-03:546, 03:548, 03:550-03:554, 03:556-03:560N, 04:01:01:01-04:01:01:29, 04:01:01:31-04:01:15, 04:01:17-04:01:139, 04:03:01:01-04:04:20, 04:24-04:53, 04:55-04:71, 04:73-04:107, 04:109-04:334, 04:336-04:340, 04:342-04:359, 04:361-04:366, 04:368-04:438, 04:440-04:442,



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22^{17,18}	135 bp	800 bp	*01:169:02, 01:177, 02:02:13, 02:02:29, 02:02:38, 02:02:53, 03:02:01-03:02:09, 03:02:11-03:03:20, 03:03:22-03:03:50, 03:03:52-03:04:14, 03:04:16-03:04:24, 03:04:27-03:11:02, 03:13:01:01-03:17:02, 03:18:02-03:38:02, 03:40:01-03:64:01, 03:65-03:66, 03:67 ^w , 03:68-03:98, 03:100-03:117, 03:119:01-03:136, 03:138-03:143, 03:146-03:155, 03:157-03:165:02, 03:167-03:169Q, 03:171, 03:173-03:181, 03:183-03:194, 03:196-03:230, 03:232-03:247, 03:249-03:263:03, 03:265N-03:277N, 03:278 ^w , 03:279-03:294, 03:295 ^w , 03:296:01-03:323N, 03:325-03:341, 03:343, 03:345-03:453, 03:455-03:458, 03:460-03:478, 03:480-03:503, 03:505-03:529, 03:531N-03:561, 04:07:02, 04:32, 04:77, 04:265, 06:03:01, 06:132:01-06:132:02, 07:64, 07:96:01-07:96:02, 07:314:02, 07:402, 07:578, 07:756, 14:25, 15:02:10, 15:02:17, 15:43, 18:03, B*13:13:02, B*40:01:49-40:01:50, B*46:77
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24¹²	95 bp, 475 bp, 590 bp	800 bp	*02:02:01-02:02:03, 02:02:06-02:02:12, 02:02:15-02:02:34, 02:02:36, 02:02:38-02:02:52, 02:02:54-02:02:61, 02:04, 02:05:02-02:05:03, 02:06:02-02:09, 02:11, 02:13, 02:15, 02:19-02:27:01, 02:28-02:31, 02:34-02:36:01, 02:37-02:38:01N, 02:39-02:40:01, 02:42-02:43:01, 02:44-02:50, 02:52N-02:55:01, 02:56-02:57, 02:59-02:71, 02:74-02:75, 02:77-02:88, 02:90-02:93, 02:96-02:108, 02:111-02:123, 02:126-02:132, 02:134, 02:136, 02:138-02:142, 02:144-02:160, 02:162-02:167, 02:170-02:173, 02:175, 02:177-02:179, 02:183-02:196, 02:198-02:203, 03:287:01, 05:01:60, 05:16,



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25^{11,14}	260 bp, 360 bp, 425 bp	1070 bp	*01:177, 01:186, 03:231, 03:248, 03:308, 03:557, 04:01:01:01-04:01:01:29, 04:01:01:31-04:01:139, 04:03:01:01-04:04:20, 04:23-04:212, 04:214-04:225N, 04:227-04:350N, 04:352-04:431, 04:433-04:442, 05:78:01-05:78:02, 05:141, 06:120, 08:163, 08:183, 12:132, 12:146, 12:194, 12:269, 12:287, 16:34, 16:62, 16:150
26¹⁵	155 bp, 225 bp	1070 bp	*01:02:01:01-01:03:02, 01:06-01:07:01, 01:08, 01:10-01:20, 01:23-01:34, 01:37N-01:48, 01:51-01:54, 01:56N-01:78, 01:80-01:119, 01:121Q-01:130, 01:132-01:157, 01:159, 01:161-01:175, 01:177-01:211N, 01:213, 02:12, 02:49, 02:55:01-02:55:02, 02:115, 03:15, 03:27, 03:38:01-03:38:02, 03:58, 03:69, 03:86, 03:94, 03:130, 03:136, 03:163, 03:246, 03:274, 03:297, 03:431, 03:461, 04:03:01:01-04:03:01:02, 04:03:03-04:03:07, 04:06:01-04:06:03, 04:16, 04:37, 04:80, 04:103:01-04:103:02, 04:107, 04:129, 04:147, 04:160:01-04:160:02, 04:171, 04:190, 04:230, 04:256, 04:263, 04:286, 04:294, 04:335, 04:337, 04:351:01-04:351:02, 04:357, 04:363, 04:381, 04:383, 04:393, 04:400, 04:402, 05:16, 05:42, 05:46:01:01-05:46:01:02, 05:85, 05:107, 05:241, 06:03:01-06:03:02, 06:05-06:06:01:02, 06:67, 06:76:01-06:76:02, 06:132:01-06:132:02, 06:204, 06:271, 07:26:01:01-07:26:03, 07:92, 07:96:01-07:96:02, 07:101, 07:148, 07:161, 07:314:01-07:314:03, 07:317, 07:351, 07:578, 07:583, 07:723, 07:756, 07:821N, 07:845, 07:870, 07:891, 07:894, 08:05, 08:12:01:01-08:12:01:02, 08:21, 08:25, 08:137, 12:02:01-12:03:12, 12:03:13 ^w , 12:03:14-12:04:02:02, 12:06-12:15, 12:17-12:20, 12:22-12:32, 12:34-12:48, 12:50-12:54, 12:56-12:97, 12:99:01-12:146, 12:148N-12:187, 12:189-12:194, 12:196-12:216, 12:218-12:268, 12:270N-12:298, 12:300, 12:302-12:342Q, 14:02:01:01-14:02:31, 14:02:33-14:05, 14:07N, 14:10-14:14, 14:17-14:27, 14:29-14:52, 14:55-14:62, 14:64-14:76, 14:78-14:86, 14:88-14:89, 14:91, 14:93N-14:104, 14:106-14:128, 15:03, 15:16, 15:25, 15:102, 16:15:01-16:15:02, 16:25, 16:53, 16:64, 16:68, 16:88, 17:01:01:02-17:19, 17:21-17:26, 17:27N ^w , 17:28-17:39, 17:41-17:59, 18:09, A*25:55, B*07:13, B*07:15, B*07:160, B*07:239, B*14:03, B*67:02:01:01-67:02:01:02
27	140 bp, 245 bp	1070 bp	*01:02:34, 01:21, 02:12 ^w , 02:27:01-02:27:02, 02:87, 02:115, 02:126 ^w , 02:131, 03:04:25, 04:11, 04:29, 04:36, 04:55, 04:172, 04:214 ^w , 07:01:74, 07:02:09, 07:125:02, 07:449, 07:583, 07:723, 08:01:01:01-08:01:29, 08:01:31-08:02:10, 08:02:12-08:09, 08:11-08:63, 08:65-08:94, 08:95 ^w , 08:96-08:225Q, 12:02:01-12:02:10, 12:02:12-12:02:22, 12:02:23 ^w , 12:02:24-12:02:27, 12:02:28 ^w , 12:02:30-12:03:03, 12:03:05-12:03:08, 12:03:10-12:03:23, 12:03:24 ^w , 12:03:25-12:03:33, 12:03:35-12:03:69, 12:03:70 ^w , 12:03:71-12:03:72, 12:06-12:08, 12:10:01-12:16:01, 12:17-12:20, 12:22-12:26, 12:28-12:32, 12:34-12:40, 12:42Q-12:53, 12:55-12:59, 12:61-12:71, 12:72 ^w , 12:73-12:122, 12:124-12:134, 12:135 ^w , 12:136-12:145, 12:147-12:153, 12:154 ^w , 12:155Q-12:187, 12:189-12:194, 12:195:02, 12:196-12:298, 12:300-12:342Q, 14:02:03, 14:03:01:01-14:03:01:02, 14:03:03-14:03:05, 14:08, 14:10, 14:22, 14:35N, 14:38, 14:41, 14:53-14:54, 14:61, 14:70, 14:78-14:79, 14:86, 14:90, 14:112-14:113, 14:116, 14:118, 14:126, 15:07:01:01-15:07:01:02, 15:21 ^w , 15:25, 15:116 ^w , 15:144, 16:01:01:01-16:01:01:23, 16:01:03-16:01:15, 16:01:17-16:01:25, 16:01:27-16:01:41, 16:04:01:01-16:04:01:03,



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28¹⁴	215 bp, 555 bp	1070 bp	*01:97, 01:114:01-01:114:02, 01:168-01:169:02, 03:58, 03:86, 03:94, 03:209, 03:302, 04:01:84, 04:09N, 04:263, 05:85, 05:107, 05:241, 12:178, 14:02:01:01-14:02:31, 14:02:33-14:04, 14:07N, 14:10-14:14, 14:17-14:27, 14:29-14:44, 14:46:01-14:52, 14:55-14:62, 14:64-14:76, 14:78-14:86, 14:88-14:89, 14:91, 14:93N-14:104, 14:106-14:128, 15:37, 15:102, 16:18, B*46:84, B*54:38
29	175 bp	800 bp	*03:08, 03:29, 03:31, 03:246, 03:555, 07:20:01-07:20:02, 07:96:01-07:96:02, 07:263, 15:02:01:01-15:05:07, 15:05:09-15:09:02, 15:12-15:13:02, 15:15, 15:18-15:19, 15:21-15:24, 15:26, 15:28-15:42, 15:44:01-15:62, 15:64-15:106, 15:108-15:112, 15:114-15:123, 15:125-15:191, 15:193-15:207, 15:209-15:233, 16:70
30^{13,14}	160 bp, 370 bp, 540 bp	1070 bp	*01:21, 02:12, 02:49, 02:55:01-02:55:02, 02:115, 04:01:55, 04:14-04:15:01, 04:15:03, 04:68, 04:294, 04:367, 05:112, 06:02:37, 06:127:02, 06:264, 07:01:07, 07:04:03, 07:14, 07:27:02, 07:31:02, 07:43:02, 07:53, 07:199:02, 07:216, 07:526:01, 07:681, 07:932, 12:02:01-12:02:02:15, 12:02:04-12:02:07, 12:02:09-12:02:11, 12:02:13-12:02:42, 12:03:29, 12:03:32, 12:08, 12:14:01-12:14:02, 12:16:01-12:18:02, 12:22, 12:27, 12:30, 12:36, 12:40-12:41, 12:56, 12:64, 12:67-12:69, 12:72-12:74, 12:80N, 12:83-12:86, 12:103-12:106, 12:112, 12:114, 12:117, 12:123-12:124, 12:126-12:128, 12:130, 12:132, 12:134, 12:136-12:137, 12:142, 12:145-12:146, 12:148N, 12:151, 12:161, 12:164, 12:166, 12:168-12:169, 12:177, 12:179, 12:183, 12:193, 12:196, 12:198, 12:200, 12:204, 12:207, 12:212, 12:214, 12:217, 12:219N, 12:224, 12:226, 12:228, 12:231, 12:234, 12:236N, 12:239-12:241, 12:243, 12:247, 12:250, 12:252, 12:255, 12:261, 12:263, 12:268, 12:270N, 12:275, 12:279-12:281, 12:285, 12:287, 12:294, 12:298, 12:303-12:304, 12:307-12:308, 12:315, 12:327N, 12:329N, 12:335-12:336, 12:338, 14:90, 15:75, 16:01:01:01-16:02:19, 16:06-16:28, 16:30N-16:32, 16:34, 16:36-16:39:02, 16:41, 16:43-16:47, 16:49-16:52, 16:54, 16:56-16:60, 16:62-16:65, 16:69-16:77N, 16:79-16:81, 16:83-16:87, 16:89N-16:90, 16:92-16:102, 16:104-16:108, 16:111-16:123N, 16:125-16:139, 16:141-16:148, 16:151-16:181, 16:183-16:184, 17:01:10, A*24:96, A*24:106, A*24:174, B*57:129
31	520 bp	1070 bp	*01:14, 01:154, 02:02:01-02:02:03, 02:02:06-02:02:34, 02:02:36-02:02:61, 02:04-02:15, 02:17, 02:19-02:26:03, 02:28-02:40:02, 02:42-02:64, 02:66-02:71, 02:73-02:86, 02:88-02:114, 02:116-02:130, 02:132-02:134, 02:136, 02:138-02:179, 02:181-02:203, 04:01:01:01-04:01:01:29, 04:01:01:31-04:01:76, 04:01:78-04:01:139, 04:03:01:01-04:03:07, 04:05, 04:07:01-04:10, 04:12, 04:15:01-04:20, 04:23-04:28, 04:30-04:33, 04:35:01-04:35:02, 04:37-04:54:02, 04:56-04:57, 04:59Q-04:67, 04:69-04:110, 04:112-04:113, 04:115N-04:121, 04:123N-04:159, 04:161-04:171, 04:173N-04:177, 04:179-04:187, 04:189-04:211, 04:213-04:248, 04:250-04:264, 04:266-04:281,



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32¹⁹	-	-	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 HLA-C 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 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.

³For 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.

⁴Primer mix 2 will for most C*02 alleles give rise to two specific PCR fragments.

⁵Primer mix 4 will for most C*03 alleles give rise to two specific PCR fragments.

⁶Primer mix 7 will for most C*05 alleles give rise to two specific PCR fragments.

⁷Primer mix 9 will for most C*07 alleles give rise to two specific PCR fragments.

⁸Primer mix 10 will for most C*08 alleles give rise to multiple specific PCR fragments.

⁹Primer mix 12 will for most C*12 alleles give rise to two specific PCR fragments.

¹⁰Primer mix 17 will for most C*15 alleles give rise to two specific PCR fragments.

¹¹Primer mix 25 will for most C*04 alleles give rise to two specific PCR fragments.

¹²HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

¹³Primer mixes 8, 12, 13, 19 and 30 may have tendencies of unspecific amplifications.

¹⁴Primer mixes 2, 15, 16, 18, 20, 25, 28 and 30 have a tendency to giving rise to primer oligomer formation.



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¹⁵Primer mixes 3, 6, 10 and 26 may give rise to a lower yield of HLA-specific PCR product than the other HLA-C low primer mixes.

¹⁶Primer mix 14 might faintly amplify most C*01 and the C*14 alleles.

¹⁷Primer mix 22 might generate a false band of about 500 base pairs. This band should be disregarded when interpreting HLA-C low resolution typings.

¹⁸In primer mix 22 the positive control band may be weaker than for other HLA-C low resolution primer mixes.

¹⁹Primer mix 32 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.

Abbreviations

w: might be weakly amplified.

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



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PRIMER SPECIFICATION

Well No.	1	2	3	4	5	6	7	8	9	10	11	12
Length of spec.	95	130	265	85	280	135	165	125	245	110	155	100
PCR product	150	200		170		330	390	355	425	165	255	155
	210	270		210			445			390	340	220
		300		275								
Length of int.	800	800	800	1070	800	800	1070	800	800	800	1070	800
pos. control ¹												
5'-primer(s) ²	89	47	105	98	105	47	1 st I	28	47	1 st I	1 st I	361
	5'-gAA 3'	5'-Agg 3'	5'-gCT 3'	5'-CTT 3'	5'-gCT 3'	5'-Agg 3'	5'-CgA 3'	5'-TCA 3'	5'-Agg 3'	5'-CgA 3'	5'-CgA 3'	5'-AgT 3'
	89	89	134	355		112	176	2 nd I	648	176	419	419
	5'-gAA 3'	5'-gAA 3'	5'-CCA 3'	5'-TCA 3'		5'-CCT 3'	5'-gCA 3'	5'-CCA 3'	5'-CAC 3'	5'-gCA 3'	5'-gTC 3'	5'-gTC 3'
	89	2 nd I		419		118	527			527		
	5'-gAA 3'	5'-CCA 3'		5'-gTC 3'		5'-CCA 3'	5'-TgA 3'			5'-TAC 3'		
	98	703		459								
	5'-CTT 3'	5'-CTA 3'		5'-gAT 3'								
	368											
	5'-gTg 3'											
3'-primer(s) ³	142	176	343	142	343	201	302	213	302	302	118	474
	5'-TgA 3'	5'-ACT 3'	5'-C 3'	5'-TgA 3'	5'-T 3'	5'-CTT 3'	5'-ggT 3'	5'-Cgg 3'	5'-ggC 3'	5'-ggC 3'	5'-gCT 3'	5'-gCA 3'
	201	559	343	589		218	307	409	853	595	218	477
	5'-CTT 3'	5'-CTC 3'	5'-g 3'	5'-CTT 3'		5'-gCT 3'	5'-CCA 3'	5'-ATg 3'	5'-CAT 3'	5'-CCC 3'	5'-gCT 3'	5'-gCA 3'
	201	861					3 rd I	412			302	538
	5'-CTC 3'	5'-TCg 3'					5'-gCA 3'	5'-gTC 3'			5'-ggT 3'	5'-gCA 3'
	538							420			304	
	5'-CCg 3'							5'-gCT 3'			5'-CAA 3'	
											539	
											5'-TCT 3'	
Well No.	1	2	3	4	5	6	7	8	9	10	11	12



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Well No.	13	14	15	16	17	18	19	20	21	22	23	24
Length of spec.	120	160	130	160	110	180	225	215	325	135	155	95
PCR product	250	215	255	260	325	210	250	420	380		235	475
				445		240	290					590
Length of int. pos. control ¹	800	800	800	1070	800	1070	800	800	1070	800	1070	800
5'-primer(s) ²	201 5'-CCA 3'	97 5'-TCg 3'	98 5'-CTA 3'	85 5'-CCg 3'	201 5'-CCA 3'	201 5'-CCA 3'	2 nd I 5'-CCA 3'	47 5'-Agg 3'	355 5'-TCA 3'	105 5'-gCT 3'	97 5'-TCg 3'	176 5'-gCA 3'
	218 5'-ggA 3'	361 5'-AgT 3'	368 5'-gTg 3'	98 5'-CTC 3'	409 5'-ggC 3'	2 nd I 5'-CCA 3'		117 5'-CCT 3'	412 5'-ATA 3'	112 5'-CCT 3'	97 5'-TTg 3'	486 5'-ACA 3'
	2 nd I 5'-CCA 3'			98 5'-CTT 3'		361 5'-AgT 3'		361 5'-AgT 3'		459 5'-gAT 3'		
				98 5'-CAC 3'								
				194 5'-CgT 3'								
				527 5'-TgA 3'								
3'-primer(s) ³	289 5'-AgC 3'	218 5'-gCT 3'	312 5'-AgT 3'	311 5'-ggT 3'	270 5'-TAg 3'	341 5'-CgT 3'	512 5'-CCA 3'	289 5'-AgT 3'	3 rd I 5'-CTC 3'	201 5'-CTC 3'	213 5'-Cgg 3'	361 5'-CCA 3'
	289 5'-AgC 3'	527 5'-CCg 3'	312 5'-AgT 3'	317 5'-CgT 3'	3 rd I 5'-CTC 3'	343 5'-T 3'	538 5'-gTC 3'	302 5'-ggT 3'		559 5'-CTC 3'	289 5'-AgC 3'	474 5'-gCA 3'
	291 5'-TCg 3'	538 5'-CCA 3'	459 5'-AgA 3'	3 rd I 5'-gCA 3'		343 5'-g 3'	580 5'-TCC 3'	527 5'-CCg 3'			289 5'-AgC 3'	538 5'-CCA 3'
	539 5'-TCT 3'	538 5'-gCA 3'				527 5'-CCg 3'		538 5'-CCg 3'				
						527 5'-CCg 3'		540 5'-CTT 3'				
						527 5'-CCg 3'						
						527 5'-CCg 3'						
						530 5'-CCA 3'						
Well No.	13	14	15	16	17	18	19	20	21	22	23	24



101.601-24/12 – including *Taq* pol., IFU-01
101.601-24u/12u – without *Taq* pol., IFU-02

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“Instructions for Use” (IFU)

Lot No.: **4N6**

Lot-specific information

Well No.	25	26	27	28	29	30	31
Length of spec.	260	155	140	215	175	160	520
PCR product	360	225	245	555		370	
	425					540	
Length of int. pos. control ¹	1070	1070	1070	1070	800	1070	1070
5'-primer(s) ²	28	98	97	98	134	289	312
	5'-TCA 3'	5'-CTA 3'	5'-TCA 3'	5'-CTA 3'	5'-CCA 3'	5'-Agg 3'	5'-AAA 3'
	341	176	201	368		418	
	5'-ggA 3'	5'-gCA 3'	5'-CCA 3'	5'-gTT 3'		5'-Agg 3'	
		361		368		419	
		5'-AgT 3'		5'-gTT 3'		5'-gTC 3'	
				1018		419	
				5'-gTg 3'		5'-gTT 3'	
3'-primer(s) ³	112	289	302	361	270	369	539
	5'-CCA 3'	5'-AgC 3'	5'-ggC 3'	5'-CCA 3'	5'-TAg 3'	5'-CCg 3'	5'-TCC 3'
	118	289		538		539	
	5'-gCT 3'	5'-AgC 3'		5'-CCg 3'		5'-TCT 3'	
	218	538		1092			
	5'-gCT 3'	5'-CCg 3'		5'-TTA 3'			
	477						
	5'-gCA 3'						
Well No.	25	26	27	28	29	30	31

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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Lot No.: **4N6**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-C low resolution SSP primer set ²																				
					Well															
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
				Prod. No.:	202128801	202128802	202133903	202128804	202128805	202128806	202128807	202128808	202128809	202128810	202128811	202128812	202128813	202128814	202128815	202128816
	IHWC cell line ¹		C*																	
1	9001	SA	*07:02		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
2	9280	LK707	*07:01	*15:05	-	-	+	-	-	-	-	+	+	-	+	-	-	-	+	-
3	9011	E4181324	*12:02		-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
4	9275	GU373	*03:04	*04:01	-	-	+	+	-	+	-	-	-	-	+	-	+	-	-	-
5	9009	KAS011	*06:02		-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-
6	9353	SM	*03:04	*07:02	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-
7	9020	QBL	*05:01		-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	-
8	9025	DEU	*04:01		-	-	-	-	-	+	-	-	-	-	+	-	+	-	-	-
9	9026	YAR	*12:03		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
10	9107	LKT3	*01:02		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*16:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
12	9052	DBB	*06:02		-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-
13	9004	JESTHOM	*01:02		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*01:02	*03:04	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*03:04		-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*02:02		-	+	+	-	-	+	-	-	-	-	+	-	-	-	+	-
17	9282	CTM3953540	*03:03	*07:01	-	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-
18	9257	32367	*01:02	*07:05	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
19	9038	BM16	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
20	9059	SLE005	*03:04		-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*03:03		-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*12:03		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
23	9124	IHL	*01:02	*15:02	+	-	+	-	-	-	-	+	-	-	+	-	-	-	+	-
24	9035	JBUSH	*12:03		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
25	9049	IBW9	*08:02		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
26	9285	WT49	*07:18		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
27	9191	CH1007	*07:04	*15:29	-	-	+	-	-	-	-	+	+	-	+	-	-	-	+	-
28	9320	BEL5GB	*05:01	*16:01	-	-	-	-	-	-	+	-	-	-	+	-	+	-	+	-
29	9050	MOU	*16:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
30	9021	RSH	*17:01		-	+	-	-	-	-	-	-	-	-	+	-	-	-	+	-
31	9019	DUCAF	*05:01		-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	-
32	9297	HAG	*17:03		-	+	-	-	-	-	-	-	-	-	+	-	-	-	+	-
33	9098	MT14B	*03:04		-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*12:03		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
35	9302	SSTO	*05:01		-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	-
36	9024	KT17	*03:03	*04:01	-	-	-	+	+	+	-	-	-	-	+	-	+	-	-	-
37	9065	HHKB	*07:02		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
38	9099	LZL	*03:03		-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*02:02	*07:01	-	+	+	-	-	+	-	-	+	-	+	-	-	-	+	-
40	9134	WHONP199	*01:02	*06:02	+	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-
41	9055	H0301	*08:02		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
42	9066	TAB089	*01:02		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*01:02	*08:01	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
44	9057	TEM	*12:03		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
45	9239	SHJO	*06:02	*17:01	-	+	-	-	-	-	-	+	-	-	+	-	-	+	+	-
46	9013	SCHU	*07:02		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
47	9045	TUBO	*07:04	*15:02	-	-	+	-	-	-	-	+	+	-	+	-	-	-	+	-
48	9303	TER-ND	*04:01	*16:01	-	-	-	-	-	+	-	-	-	-	+	-	+	-	-	-



101.601-24/12 – including *Taq* pol., IFU-01
101.601-24u/12u – without *Taq* pol., IFU-02

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Lot No.: **4N6**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-C low resolution SSP primer set ²																				
					Well															
						17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
				Prod. No.:		202128817	202128818	202133919	202133920	202128821	202128822	202128823	201781724	202128825	201781726	202128827	202128828	202128829	202128830	202128831
	IHWC cell line ¹		C*																	
1	9001	SA	*07:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
2	9280	LK707	*07:01	*15:05	+	-	-	-	+	-	+	-	-	-	-	-	-	+	-	-
3	9011	E4181324	*12:02		-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-
4	9275	GU373	*03:04	*04:01	-	+	-	-	+	+	-	-	-	+	-	-	-	-	-	+
5	9009	KAS011	*06:02		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+
6	9353	SM	*03:04	*07:02	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-
7	9020	QBL	*05:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+
8	9025	DEU	*04:01		-	+	-	-	+	-	-	-	-	+	-	-	-	-	-	+
9	9026	YAR	*12:03		-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
10	9107	LKT3	*01:02		-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-
11	9051	PITOUT	*16:01		-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-
12	9052	DBB	*06:02		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+
13	9004	JESTHOM	*01:02		-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-
14	9071	OLGA	*01:02	*03:04	-	-	-	+	+	+	-	-	-	-	+	-	-	-	-	-
15	9075	DKB	*03:04		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
16	9037	SWEG007	*02:02		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+
17	9282	CTM3953540	*03:03	*07:01	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-
18	9257	32367	*01:02	*07:05	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-
19	9038	BM16	*07:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
20	9059	SLE005	*03:04		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*03:03		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*12:03		-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
23	9124	IHL	*01:02	*15:02	+	-	-	+	+	-	-	-	-	-	+	-	-	+	-	-
24	9035	JBUSH	*12:03		-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
25	9049	IBW9	*08:02		-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-
26	9285	WT49	*07:18		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*07:04	*15:29	+	-	-	-	+	-	+	-	-	-	-	-	-	+	-	-
28	9320	BEL5GB	*05:01	*16:01	-	+	-	-	+	-	-	-	-	-	-	+	-	-	+	+
29	9050	MOU	*16:01		-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-
30	9021	RSH	*17:01		-	-	+	-	+	-	-	-	-	-	+	-	-	-	-	-
31	9019	DUCAF	*05:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+
32	9297	HAG	*17:03		-	-	+	-	+	-	-	-	-	-	+	-	-	-	-	-
33	9098	MT14B	*03:04		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*12:03		-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
35	9302	SSTO	*05:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+
36	9024	KT17	*03:03	*04:01	-	+	-	-	+	+	-	-	-	+	-	-	-	-	-	+
37	9065	HHKB	*07:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
38	9099	LZL	*03:03		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*02:02	*07:01	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+
40	9134	WHONP199	*01:02	*06:02	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	+
41	9055	H0301	*08:02		-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-
42	9066	TAB089	*01:02		-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-
43	9076	T7526	*01:02	*08:01	-	+	-	+	+	-	-	-	-	-	+	+	-	-	-	-
44	9057	TEM	*12:03		-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
45	9239	SHJO	*06:02	*17:01	-	-	+	-	+	-	+	-	-	-	+	-	-	-	-	+
46	9013	SCHU	*07:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*07:04	*15:02	+	-	-	-	+	-	+	-	-	-	-	-	-	+	-	-
48	9303	TER-ND	*04:01	*16:01	-	+	-	-	+	-	-	-	-	+	-	+	-	-	+	+



101.601-24/12 – including *Taq* pol., IFU-01
101.601-24u/12u – without *Taq* pol., IFU-02

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Lot No.: **4N6**

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.

One or more 5'-primers and 3'-primers in primer solutions 1, 2, 4, 7, 14 to 16, 20, 22, 24 to 26 and 28 were tested by separately adding one or two additional 3'-primers or one or two additional 5'-primers respectively. One or more 3'-primers in primer solutions 8, 11, 18 and 19 were tested by separately adding one or two additional 5'-primers. One or more 5'-primers in primer solutions 6, 13, 27 and 30 were tested by separately adding one or two additional 3'-primers.

In primer solutions 1, 16, 23 and 28 one or two 5'-primers were not possible to be tested, and in primer solutions 3, 7, 11 to 16, 18 and 20 one or two 3'-primers were not possible to be tested.



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101.601-24u/12u – without *Taq* pol., IFU-02

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Lot No.: **4N6**

Lot-specific information

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