

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

Visit <https://labproducts.caredx.com> for
“Instructions for Use” (IFU)

Lot No.: **4H8**

Lot-specific information

Olerup SSP[®] HLA-A*68

Product number:	101.418-12/04 – including <i>Taq</i> pol. 101.418-12u/04u – without <i>Taq</i> pol.
Lot number:	4H8
Expiry date:	2021-09-01
Number of tests:	12 tests – Product No. 101.418-12/12u 4 tests – Product No. 101.418-04/04u
Number of wells per test:	47+1
Storage - pre-aliquoted primers:	dark at -20°C
- PCR Master Mix:	-20°C
- Adhesive PCR seals	RT
- Product Insert	RT

This Product Description is only valid for Lot No. 4H8.

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*68 LOT (3G9)

The HLA-A*68 kit is updated for new alleles to enable separation of:

- Null and Alternatively expressed alleles
- The product documentation has been updated for new alleles of IMGT 3.33.0

The format of the Worksheet has been changed.

The HLA-A*68 primer set, specificity and interpretation tables have been updated for the HLA-A alleles described since the previous *Olerup SSP[®]* HLA-A*68 lot was made (**Lot No. 3G9**).

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

Well	5'-primer	3'-primer	rationale
13	-	Moved	3'-primer moved to well 43.
25	-	Added	3'-primer added from well 43.
37	-	Modified, moved	3'-primer modified and moved to well 43.
43	Removed	Moved, added	5'-primer removed. 3'-primer moved to well 25. Primer pair added from wells 13 and 37.

Change in revision R01 compared to R00:

1. Primer mix 1 does not amplify the A*68:35 allele. This has been corrected in the specificity and interpretation tables.

Changes in revision R02 compared to R01:

1. The size of the positive control band of primer mix 13 has been corrected to 800 bp in the Product Insert and the Worksheet.

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Well **48** contains Negative Control primer pairs, that will amplify more than 95% 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 430 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*68 SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for identifying the A*68:01 to A*68:178 alleles.

PLATE LAYOUT

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

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

The 48 well cut PCR plate is marked with ‘HLA-A*68’ in silver gray ink.

Well No. 1 is marked with the Lot No ‘4H8’.

Wells 1 to 47 – HLA-A*68 high resolution primers.

Well 48 – Negative Control (NC).

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 heat-sealed with a PCR-compatible foil.

Please note: When removing each 48 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

Due to the sharing of sequence motifs between HLA-A alleles non-HLA-A*68 alleles will be amplified by some primer mixes. For further details see Specificity Table.

UNIQUELY IDENTIFIED ALLELES

All the HLA-A*68 alleles, i.e. **A*68:01 to A*68:178**, recognized by the HLA Nomenclature Committee in July 2018^{1,2} will be amplified by the primers in the HLA-A*68 subtyping kit.

The HLA-A*68 kit enables separation of the confirmed HLA-A*68 alleles as listed in the IMGT/HLA database 3.25.0. An HLA allele is listed as confirmed by IMGT/HLA if it has been sequenced by more than a single laboratory or from multiple sources. Current allele confirmation status for HLA-A*68 alleles is listed below.

The HLA-A*68 kit also enables identification of null and alternatively expressed alleles.

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The following HLA-A*68 alleles can be distinguished by the different sizes of the HLA-specific PCR product:

Alleles	Primer mix	Alleles	Primer mix
A*68:19, 68:158	15	A*68:68, 68:106	39
A*68:52, 68:142N	46	A*68:99, 68:101	42

¹HLA-A alleles listed on the IMGT/HLA web page 2018-July-11, release 3.33.0, 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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ALLELE CONFIRMATION STATUS

Allele	Status ¹	Allele	Status ¹	Allele	Status ¹	Allele	Status ¹
A*68:01:01:01	Confirmed	A*68:03:02	Unconfirmed	A*68:46	Confirmed	A*68:93	Confirmed
A*68:01:01:02	Confirmed	A*68:03:03	Confirmed	A*68:47	Unconfirmed	A*68:94N	Unconfirmed
A*68:01:02:01	Confirmed	A*68:04:01	Unconfirmed	A*68:48	Unconfirmed	A*68:95	Unconfirmed
A*68:01:02:02	Confirmed	A*68:04:02	Unconfirmed	A*68:49N	Unconfirmed	A*68:96	Confirmed
A*68:01:02:03	Confirmed	A*68:05	Confirmed	A*68:50	Unconfirmed	A*68:97	Unconfirmed
A*68:01:03	Unconfirmed	A*68:06	Confirmed	A*68:51	Unconfirmed	A*68:98	Unconfirmed
A*68:01:04	Unconfirmed	A*68:07	Confirmed	A*68:52	Unconfirmed	A*68:99	Confirmed
A*68:01:05	Unconfirmed	A*68:08:01	Unconfirmed	A*68:53	Confirmed	A*68:100	Unconfirmed
A*68:01:06	Confirmed	A*68:08:02	Confirmed	A*68:54	Confirmed	A*68:101	Confirmed
A*68:01:07	Unconfirmed	A*68:09	Unconfirmed	A*68:55:01	Confirmed	A*68:102	Unconfirmed
A*68:01:08	Confirmed	A*68:10	Confirmed	A*68:55:02	Unconfirmed	A*68:103:01	Unconfirmed
A*68:01:09	Unconfirmed	A*68:11N	Confirmed	A*68:56	Unconfirmed	A*68:103:02	Unconfirmed
A*68:01:10	Unconfirmed	A*68:12	Confirmed	A*68:57	Unconfirmed	A*68:104:01	Confirmed
A*68:01:11	Unconfirmed	A*68:13:01	Confirmed	A*68:58	Unconfirmed	A*68:104:02	Unconfirmed
A*68:01:12	Unconfirmed	A*68:13:02	Unconfirmed	A*68:59N	Confirmed	A*68:105	Unconfirmed
A*68:01:13	Unconfirmed	A*68:14	Unconfirmed	A*68:60	Confirmed	A*68:106	Confirmed
A*68:01:14	Unconfirmed	A*68:15	Confirmed	A*68:61	Unconfirmed	A*68:107	Unconfirmed
A*68:01:15	Unconfirmed	A*68:16	Confirmed	A*68:62	Unconfirmed	A*68:108	Unconfirmed
A*68:01:16	Unconfirmed	A*68:17	Confirmed	A*68:63	Unconfirmed	A*68:109	Unconfirmed
A*68:01:17	Unconfirmed	A*68:18N	Confirmed	A*68:64	Unconfirmed	A*68:110	Confirmed
A*68:01:18	Unconfirmed	A*68:19	Confirmed	A*68:65	Confirmed	A*68:111	Unconfirmed
A*68:01:19	Unconfirmed	A*68:20	Unconfirmed	A*68:66	Unconfirmed	A*68:112:01	Unconfirmed
A*68:01:20	Confirmed	A*68:21:01	Unconfirmed	A*68:67	Confirmed	A*68:112:02	Confirmed
A*68:01:21	Unconfirmed	A*68:21:02	Unconfirmed	A*68:68	Confirmed	A*68:113	Unconfirmed
A*68:01:22	Confirmed	A*68:22	Unconfirmed	A*68:69	Unconfirmed	A*68:114	Unconfirmed
A*68:01:23	Unconfirmed	A*68:23	Unconfirmed	A*68:70	Unconfirmed	A*68:115	Unconfirmed
A*68:01:24	Confirmed	A*68:24	Confirmed	A*68:71	Unconfirmed	A*68:116	Unconfirmed
A*68:01:25	Confirmed	A*68:25	Confirmed	A*68:72	Confirmed	A*68:117	Confirmed
A*68:01:26	Confirmed	A*68:26	Unconfirmed	A*68:73	Unconfirmed	A*68:118	Unconfirmed
A*68:01:27	Unconfirmed	A*68:27:01	Confirmed	A*68:74	Unconfirmed	A*68:119:01	Unconfirmed
A*68:01:28	Unconfirmed	A*68:27:02	Unconfirmed	A*68:75:01	Unconfirmed	A*68:119:02	Unconfirmed
A*68:01:29	Unconfirmed	A*68:28	Unconfirmed	A*68:75:02	Unconfirmed	A*68:120N	Unconfirmed
A*68:01:30	Unconfirmed	A*68:29	Unconfirmed	A*68:76:01	Unconfirmed	A*68:121	Unconfirmed
A*68:01:31	Confirmed	A*68:30	Unconfirmed	A*68:76:02	Unconfirmed	A*68:122	Unconfirmed
A*68:01:32	Unconfirmed	A*68:31	Confirmed	A*68:77	Unconfirmed	A*68:123	Confirmed
A*68:02:01:01	Confirmed	A*68:32	Unconfirmed	A*68:78	Unconfirmed	A*68:124	Unconfirmed
A*68:02:01:02	Unconfirmed	A*68:33	Confirmed	A*68:79	Unconfirmed	A*68:125	Unconfirmed
A*68:02:01:03	Confirmed	A*68:34	Unconfirmed	A*68:80	Confirmed	A*68:126	Unconfirmed
A*68:02:02	Confirmed	A*68:35	Confirmed	A*68:81	Unconfirmed	A*68:127	Unconfirmed
A*68:02:03	Confirmed	A*68:36	Confirmed	A*68:82	Unconfirmed	A*68:128	Unconfirmed
A*68:02:04	Confirmed	A*68:37	Confirmed	A*68:83	Unconfirmed	A*68:129	Unconfirmed
A*68:02:05	Unconfirmed	A*68:38	Unconfirmed	A*68:84	Unconfirmed	A*68:130	Unconfirmed
A*68:02:06	Unconfirmed	A*68:39	Unconfirmed	A*68:85	Unconfirmed	A*68:131	Unconfirmed
A*68:02:07	Unconfirmed	A*68:40	Confirmed	A*68:86	Confirmed	A*68:132	Unconfirmed
A*68:02:08	Unconfirmed	A*68:41	Unconfirmed	A*68:87	Unconfirmed	A*68:133	Unconfirmed
A*68:02:09	Unconfirmed	A*68:42	Unconfirmed	A*68:88	Unconfirmed	A*68:134	Unconfirmed
A*68:02:10	Unconfirmed	A*68:43:01	Unconfirmed	A*68:89	Unconfirmed	A*68:135	Unconfirmed
A*68:02:11	Unconfirmed	A*68:43:02	Unconfirmed	A*68:90	Unconfirmed	A*68:136	Unconfirmed
A*68:02:12	Unconfirmed	A*68:44	Confirmed	A*68:91	Confirmed	A*68:137	Unconfirmed
A*68:03:01	Confirmed	A*68:45	Unconfirmed	A*68:92	Unconfirmed	A*68:138	Unconfirmed

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Allele	Status ¹
A*68:139	Unconfirmed
A*68:140	Unconfirmed
A*68:141	Unconfirmed
A*68:142N	Unconfirmed
A*68:143	Unconfirmed
A*68:144	Unconfirmed
A*68:145	Unconfirmed
A*68:146	Unconfirmed
A*68:147	Unconfirmed
A*68:148Q	Unconfirmed

¹Allele status “confirmed” or “unconfirmed” as listed on the IMGT/HLA web page 2016-July-14, release 3.25.0, www.ebi.ac.uk/imgt/hla.

RESOLUTION IN HOMO- AND HETEROZYGOTES

Results file with resolution in HLA-A*68 homo- and heterozygotes is available upon request.

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SPECIFICITY TABLE

HLA-A*68 SSP subtyping

Specificities and sizes of the PCR products of the 47+1 primer mixes used for HLA-A*68 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified HLA-A*68 alleles ³	Other amplified HLA-A alleles
1 ⁵	200 bp	800 bp	*68:01:01:01-68:02:12, 68:06-68:14, 68:16-68:19, 68:21:01-68:30, 68:32-68:34, 68:37-68:45, 68:46 ^w , 68:47-68:56, 68:58:01-68:83, 68:85-68:89, 68:91, 68:93-68:108, 68:110-68:135, 68:137-68:178	*01:13, 01:176, 01:194, 02:34-02:35:03, 02:56:01-02:56:02, 02:62, 02:78, 02:103, 02:580, 03:01:01:01-03:01:08, 03:01:10-03:01:22, 03:01:24-03:07:02, 03:09-03:31, 03:33-03:35, 03:37-03:40, 03:42-03:56, 03:58-03:88, 03:90-03:106, 03:109-03:110, 03:112-03:141, 03:143-03:151, 03:153-03:160, 03:162N-03:171, 03:174-03:175, 03:177, 03:179-03:193, 03:195-03:197N, 03:201-03:202, 03:204-03:205, 03:207-03:210, 03:212-03:218, 03:220-03:251, 03:253-03:259, 03:261-03:266N, 03:268-03:272, 03:274-03:305, 11:01:01:01-11:01:50, 11:01:52-11:01:84, 11:03-11:13, 11:15:01-11:15:02, 11:20-11:27, 11:29-11:37, 11:39, 11:41-11:44, 11:46-11:50Q, 11:52Q, 11:54-11:56, 11:58-11:70:02, 11:72-11:76, 11:79-11:97, 11:99N-11:100, 11:102-11:105, 11:107-11:109N, 11:112, 11:114-11:120, 11:122-11:139, 11:141-11:146, 11:148-11:160, 11:162-11:167, 11:169-11:175, 11:177, 11:179-11:189, 11:191-11:200, 11:202-11:222, 11:224-11:234, 11:236-11:249, 11:251N-11:254, 11:257-11:261, 11:263-11:270, 11:272Q-11:280, 11:282-11:286, 11:288, 24:19, 24:290, 30:18, 30:55, 31:89, 31:115, 33:125, 33:131, 34:01:01:01-34:13, 34:15-34:17, 66:01:01:01-66:02, 66:04, 66:06-66:10, 66:12-66:14, 66:16-66:27N, 66:29-66:31, 69:01:01:01-69:03, 74:13, C*03:03:43, C*03:82, C*03:184:01
2	435 bp	1070 bp	*68:01:01:01-68:01:37, 68:03:01-68:05, 68:08:01-68:09, 68:11N-68:12, 68:16-68:17, 68:19-68:26, 68:29, 68:32-68:33, 68:35-68:39, 68:41-68:43:02,	*01:51, 03:24, 11:10, 25:43, 29:105, 33:18:01-33:18:02, 34:02:01-34:04, 34:07-34:09, 34:13, 34:15

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			68:45-68:47, 68:50, 68:52, 68:55:01-68:59N, 68:63, 68:65, 68:68-68:73, 68:76:01-68:76:02, 68:79, 68:83-68:85, 68:87, 68:89-68:91, 68:93-68:96, 68:98-68:103:02, 68:105-68:109, 68:111-68:123, 68:126-68:127, 68:129, 68:131-68:137, 68:139, 68:141-68:146, 68:148Q-68:152, 68:154-68:159Q, 68:162, 68:164-68:168, 68:171N-68:173, 68:175-68:177
3	195 bp 1070 bp		*68:02:01:01-68:02:12, 68:15, 68:18N, 68:28, 68:31, 68:34, 68:39-68:40, 68:44, 68:48-68:49N, 68:51, 68:53-68:54, 68:60-68:62, 68:64, 68:67, 68:74, 68:77-68:78, 68:80-68:82, 68:86, 68:92, 68:97, 68:110, 68:124-68:125, 68:128, 68:138, 68:140, 68:147, 68:153, 68:160, 68:163, 68:169-68:170, 68:174
			*25:47
4	180 bp 225 bp	1070 bp	*68:30 *68:03:01-68:03:02, 68:05, 68:20
			*02:06:05 *02:06:05
5	140 bp	800 bp	*68:25
	235 bp		*68:04:01-68:04:02
6	230 bp	1070 bp	*68:05, 68:15, 68:20
			*02:339, 02:407, 02:449, 02:594, 32:109 *11:98, 11:250, 33:51, 66:15
7	145 bp	1070 bp	*68:06, 68:32
			*02:52
8	160 bp 240 bp	800 bp	*68:07 *68:46
9	195 bp 250 bp	800 bp	*68:47 *68:08:01-68:08:02, 68:63, 68:157, 68:168
			*25:19:01-25:19:02, 25:30, 26:43:01-26:43:02, 26:112, 34:03 [?] -34:04 [?] , 34:06 [?] -34:07 [?] , 34:09 [?] -34:10N [?] , 34:13 [?] , 34:15 [?] , 66:06
10	165 bp	800 bp	*68:09, 68:26, 68:129, 68:134
			*01:12, 01:19, 01:127, 01:136, 02:662, 03:10, 03:167, 11:01:01:01-11:01:34, 11:01:36-11:01:56, 11:01:58-11:07, 11:10-11:21N, 11:26-11:27, 11:29-11:30, 11:32:01-11:34, 11:36-11:43, 11:45-11:49, 11:51-11:52Q, 11:54-11:58, 11:60-11:93, 11:95-11:111, 11:114-11:115N, 11:117-11:129, 11:131-11:139, 11:141-11:157, 11:159-11:161, 11:163-11:175, 11:177-11:182Q, 11:184-11:190, 11:192-11:203, 11:205-11:210N, 11:212-11:215N, 11:217-11:225,

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				11:227-11:228, 11:230-11:255, 11:257, 11:259-11:268, 11:270, 11:272Q-11:288, 24:17, 24:41, 24:208, 24:296, 29:05, 29:33, 29:77, 29:87, 29:104, C*16:67
	190 bp		*68:148Q	
11⁶	160 bp	800 bp	*68:17	
	200 bp		*68:10, 68:14, 68:120N	*02:358
12	200 bp	1070 bp	*68:38, 68:110, 68:120N	C*06:139
	405 bp		*68:11N	
13	210 bp	800 bp	*68:12, 68:50, 68:117, 68:129, 68:131	*26:122
	240 bp		*68:51	*26:18
	260 bp		*68:113, 68:115	
14	400 bp	1070 bp	*68:13:01-68:13:02	*02:217:02, 02:419:01, 24:309
15	145 bp	1070 bp	*68:19	*02:237, 03:17:01, 03:171, 24:18, 24:204, 24:213
	200 bp		*68:14, 68:80-68:81, 68:158	*02:121, 02:425, 02:517, 23:47, 24:141, 24:234, 24:339, 24:347:02, C*12:37^w
16	215 bp	1070 bp	*68:15, 68:31, 68:40	*02:122, 02:143
17⁵	175 bp	1070 bp	*68:02:01:01-68:02:10, 68:02:12, 68:15, 68:18N, 68:20, 68:27:01-68:28, 68:31, 68:34, 68:40, 68:44, 68:48- 68:49N, 68:51, 68:53-68:54, 68:60-68:62, 68:64, 68:67, 68:74, 68:77-68:78, 68:80- 68:82, 68:86, 68:92, 68:97, 68:104:01-68:104:02, 68:110, 68:124-68:125, 68:128, 68:138, 68:140, 68:147, 68:153, 68:160, 68:163, 68:169-68:170, 68:174, 68:178	*02:02:01:01 ^w , 02:02:01:02-02:02:02, 02:02:04-02:03:08, 02:05:01:01 ^w - 02:05:07 ^w , 02:08 ^w , 02:22:01:01- 02:22:02, 02:47 ^w , 02:49-02:50, 02:63 ^w , 02:102 ^w , 02:104, 02:115 ^w , 02:117, 02:122, 02:135-02:136, 02:148, 02:154 ^w -02:155 ^w , 02:172 ^w , 02:179 ^w , 02:186 ^w , 02:191, 02:209 ^w , 02:230, 02:232 ^w , 02:253, 02:258, 02:264, 02:267, 02:281, 02:286 ^w , 02:315, 02:320 ^w , 02:323, 02:324 ^w , 02:337 ^w , 02:344 ^w , 02:345, 02:355, 02:359 ^w , 02:370, 02:373N ^w , 02:376 ^w , 02:382, 02:402, 02:412, 02:413 ^w , 02:421 ^w , 02:427, 02:431, 02:433 ^w , 02:447, 02:463, 02:466, 02:480, 02:484 ^w , 02:489 ^w , 02:492 ^w , 02:495 ^w - 02:496 ^w , 02:505, 02:507 ^w , 02:517 ^w , 02:529, 02:531 ^w -02:532 ^w , 02:544, 02:546 ^w , 02:557, 02:568, 02:572, 02:577 ^w , 02:591:01 ^w , 02:591:02, 02:593 ^w , 02:595, 02:601 ^w , 02:612 ^w , 02:626, 02:631, 02:633-02:634, 02:636, 02:641, 02:643N, 02:646, 02:651, 02:655, 02:666-02:667, 02:670, 02:676, 02:680, 02:682- 02:684, 02:709, 02:711, 02:717, 02:731, 02:734, 23:02, 23:66, 24:06, 24:87, 24:138, 24:167, 24:285, 24:289, 24:339, 24:381, 25:01:01:01- 25:03, 25:05-25:11, 25:13-25:18, 25:20-25:29, 25:31-25:42N, 25:45- 25:48, 26:01:01:01-26:01:04, 26:01:07-26:07:02, 26:09-26:26,

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18	200 bp	800 bp	*68:26, 68:65, 68:115, 68:131	*01:01:01:01-01:01:65, 01:01:67-01:04:01:02N, 01:06-01:29, 01:31N-01:33, 01:35-01:71, 01:73-01:78, 01:80-01:101, 01:103-01:144, 01:146-01:166, 01:168-01:199, 01:201-01:227, 01:229-01:235, 01:237-01:243, 01:245-01:261, 03:18, 03:97, 03:122, 03:135, 03:167, 11:27, 11:38-11:39, 11:94, 11:209, 11:271, 23:53, 23:70, 24:17, 24:41, 24:208, 24:296, 29:03, 29:33, 80:01:01:01-80:03
	225 bp		*68:21:01-68:21:02	*01:86, 03:04:01-03:04:03, 11:153:01-11:153:02
19	325 bp	1070 bp	*68:22	*29:86, 33:63
20^{4,6}	90 bp	1070 bp	*68:23, 68:105	*01:20, 01:66, 01:73, 01:130, 02:114, 02:246, 02:279, 02:527, 02:582, 02:662, 03:95, 03:177, 11:288, 29:22, 29:89
21	170 bp	1070 bp	*68:28	*02:49, 02:682-02:683, 24:87, 24:285, 24:289, 31:97, 66:19, B*07:197, B*27:45, B*27:108
	215 bp		*68:24, 68:123	
22	170 bp	800 bp	*68:01:01:01-68:01:37, 68:03:01-68:05, 68:07, 68:10-68:14, 68:16-68:17, 68:19-68:25, 68:29-68:30, 68:32-68:33, 68:35-68:39, 68:41-68:43:02, 68:45-68:47, 68:50, 68:52, 68:55:01-68:59N, 68:65-68:66:02, 68:68-68:73, 68:75:01-68:76:02, 68:79, 68:83-68:85, 68:87-68:91, 68:93-68:96, 68:98-68:103:02, 68:105-68:107, 68:109, 68:111-68:112:02, 68:114, 68:116-68:123, 68:126-68:127, 68:130:01-68:133, 68:135-68:137, 68:139, 68:141-68:146, 68:148Q-68:152, 68:154-68:156, 68:158-68:159Q, 68:162,	*01:01:01:01 ^w -01:01:01:04 ^w , 01:01:02 ^w -01:01:76 ^w , 01:01:79 ^w , 01:01:81 ^w , 01:02 ^w -01:03:01:01 ^w , 01:04:01:01N ^w , 01:07 ^w -01:09:01:01 ^w , 01:09:02 ^w -01:11N ^w , 01:13 ^w -01:18N ^w , 01:20 ^w -01:24 ^w , 01:26 ^w -01:29 ^w , 01:31N ^w -01:33 ^w , 01:35 ^w -01:78 ^w , 01:80 ^w -01:88:01 ^w , 01:89 ^w -01:97 ^w , 01:98, 01:99 ^w -01:126 ^w , 01:128 ^w -01:135 ^w , 01:137 ^w -01:144 ^w , 01:146 ^w -01:199 ^w , 01:201 ^w -01:211 ^w , 01:213 ^w -01:217 ^w , 02:229, 02:527, 02:582, 03:18 ^w , 03:50, 03:66, 03:225, 11:08, 11:44, 11:183, 11:191, 11:269, 25:43, 29:01:03, 29:28, 29:79, 36:01 ^w , 36:02, 36:03 ^w -36:05 ^w

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23	185 bp	1070 bp	*68:01:01:01-68:01:37, 68:03:01-68:05, 68:07-68:14, 68:16-68:17, 68:19-68:25, 68:26 ^w , 68:29-68:30, 68:32-68:33, 68:35-68:39, 68:41-68:43:02, 68:45-68:47, 68:50, 68:52, 68:55:01-68:59N, 68:63, 68:66:01-68:66:02, 68:68-68:73, 68:75:01-68:76:02, 68:79, 68:83-68:85, 68:87-68:91, 68:93-68:96, 68:98-68:103:02, 68:105-68:109, 68:111-68:114, 68:116-68:123, 68:126-68:127, 68:129-68:130:02, 68:132-68:133, 68:135-68:137, 68:139, 68:141-68:146, 68:149-68:152, 68:154-68:156, 68:158-68:159Q, 68:162, 68:164-68:168, 68:171N-68:173, 68:175-68:177	*01:200, 01:244, 02:114, 02:229, 02:246, 02:279, 02:527, 02:582, 02:662, 02:681, 03:01:01:01-03:01:29, 03:01:31-03:01:49, 03:01:51-03:17:02, 03:20-03:39, 03:41-03:42, 03:44:01-03:52, 03:54-03:81, 03:83-03:96, 03:99-03:102, 03:104, 03:106-03:121, 03:123:01-03:134, 03:136-03:166, 03:168N-03:169, 03:171-03:185, 03:187-03:190, 03:192N-03:193, 03:195-03:196, 03:198-03:199, 03:201-03:207, 03:209-03:225, 03:227-03:235, 03:237-03:259, 03:261, 03:263-03:281, 03:283N-03:305, 11:04, 11:35, 11:130, 29:01:01:01-29:02:01:05, 29:02:03-29:02:25, 29:04-29:31, 29:34-29:66, 29:68-29:69, 29:71-29:81, 29:83-29:113, 30:26, 31:03-31:04, 31:06, 32:04, 32:30:01-32:30:02, 32:32, 33:18:01-33:18:02, 34:02:01-34:04, 34:07-34:10N, 34:13, 34:15, 36:01-36:03, 36:05-36:06, C*16:67
24⁴	85 bp	1070 bp	*68:112:01-68:112:02	*33:147, 34:15, B*08:131, B*08:136, B*08:139
	375 bp		*68:105	*02:55, 02:644, 26:22, 33:22, 66:09, 69:01:01:01-69:03
25	240 bp	1070 bp	*68:29	*02:243:01-02:243:03, 24:82
	365 bp		*68:94N	*26:71N
26⁴	100 bp	1070 bp	*68:49N	
	190 bp		*68:33, 68:80	*24:141, 33:03:17
27⁴	105 bp	1070 bp	*68:18N	
	185 bp		*68:34	*02:385, 02:529, 33:120
	235 bp		*68:43:01-68:43:02	*11:219
28	200 bp	1070 bp	*68:35, 68:38, 68:110	C*06:139
	230 bp		*68:44	
29^{4,5,7}	80 bp	800 bp	*68:42, 68:54, 68:61, 68:63	*02:03:01-02:03:08, 02:26, 02:99, 02:117, 02:148, 02:171:02, 02:253, 02:258, 02:264, 02:281, 02:315, 02:323, 02:345, 02:355, 02:370, 02:393, 02:402, 02:412, 02:427, 02:431, 02:447, 02:463, 02:466, 02:480, 02:489, 02:505, 02:529, 02:541, 02:544, 02:557, 02:568, 02:589, 02:592, 02:595, 02:612, 02:633-02:634, 02:641, 02:666, 02:684, 02:711, 03:01:38, 03:123:02, 11:25:01, 11:191, 26:01:17
	250 bp		*68:36-68:37	B*44:03:19-44:03:20
30	145 bp	1070 bp		*02:117, 02:135, 25:01:01:01, 25:01:02-25:01:08, 25:02-25:07,

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31⁵	245 bp 220 bp	1070 bp	*68:37 *68:48, 68:50, 68:129, 68:137	*25:01:01:01-25:04, 25:06-25:07, 25:09-25:21, 25:23-25:25, 25:27:01-25:48, 26:01:01:01-26:01:25, 26:01:27-26:02:01, 26:03:01-26:10, 26:12-26:43:02, 26:45-26:46, 26:48-26:53, 26:55-26:155, 34:01:01:01-34:01:02, 34:03 [?] -34:04 [?] , 34:05, 34:06 [?] -34:07 [?] , 34:09 [?] -34:13 [?] , 34:14, 34:15 [?] -34:17 [?] , 43:01, 66:01:01:01-66:01:02, 66:01:04-66:15, 66:17, 66:19-66:31
32^{4,7}	120 bp	800 bp	*68:21:01, 68:53	*02:74:02, 02:159
33	150 bp	1070 bp	*68:16	
34⁴	105 bp 165 bp	1070 bp	*68:18N *68:55:01-68:55:02, 68:124	*03:163, 03:244
35⁶	140 bp 295 bp	1070 bp	*68:59N *68:93, 68:97	*26:132, 32:73, B*44:129
36	195 bp	1070 bp	*68:01:01:01-68:01:01:03, 68:01:03-68:01:05, 68:01:07-68:01:12, 68:01:14, 68:01:18-68:01:20, 68:01:28, 68:01:32, 68:01:35, 68:03:03-68:04:01, 68:08:01, 68:21:02-68:22, 68:25-68:27:02, 68:35, 68:42-68:43:02, 68:50, 68:55:01, 68:56, 68:58:01, 68:59N, 68:63, 68:68, 68:72, 68:75:02, 68:76:02, 68:79, 68:87-68:88, 68:94N, 68:103:01, 68:104:02, 68:106, 68:113, 68:119:01, 68:121:02-68:122, 68:126-68:127, 68:129, 68:133, 68:135, 68:139, 68:143, 68:151, 68:154, 68:161, 68:165-68:166, 68:171N-68:172, 68:175-68:177	*11:10, 25:01:01:01-25:01:03, 25:01:05-25:02, 25:04-25:14, 25:16, 25:18-25:29, 25:31-25:45, 25:48, 26:01:01:01-26:01:29, 26:01:31-26:06, 26:08-26:15, 26:17-26:18, 26:21-26:34, 26:36-26:43:02, 26:45-26:63, 26:65-26:71N, 26:73-26:82, 26:84-26:88, 26:90-26:91, 26:93-26:155, 33:51, 34:01:01:01-34:07, 34:09-34:17, 66:01:01:01-66:22, 66:24-66:31, 69:01:01:01-69:01:01:02, 69:01:03-69:03
37	145 bp 170 bp 285 bp	800 bp	*68:67 *68:123 *68:26, 68:65, 68:115, 68:131	*26:125, 34:12 [?] , 66:30 *25:36, 26:29, 26:49, 66:10
38⁶	165 bp	1070 bp	*68:91, 68:140	*25:01:01:01-25:19:02, 25:21-25:37, 25:39-25:48, 26:01:01:01-26:09, 26:11N-26:43:02, 26:45-26:155,

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39⁴	95 bp 180 bp	1070 bp	*68:106 *68:68	
40	215 bp	1070 bp	*68:01:01:01-68:01:16, 68:01:18-68:01:37, 68:03:01- 68:07, 68:10-68:14, 68:16- 68:17, 68:19-68:22, 68:24- 68:25, 68:29-68:30, 68:32- 68:33, 68:35-68:39, 68:41- 68:43:02, 68:45-68:47, 68:50, 68:52, 68:55:01-68:59N, 68:65-68:66:02, 68:68-68:72, 68:75:01-68:76:02, 68:79, 68:84-68:85, 68:87-68:91, 68:93-68:96, 68:98-68:102, 68:104:01-68:104:02, 68:106- 68:109, 68:111-68:114, 68:116-68:123, 68:126- 68:127, 68:130:01-68:133, 68:135-68:137, 68:139, 68:141-68:144, 68:146, 68:148Q-68:150, 68:152, 68:154-68:156, 68:158- 68:159Q, 68:161-68:162, 68:164-68:167, 68:172- 68:173, 68:175-68:177	*02:680 ^w , 23:02 ^w , 23:66 ^w , 24:06 ^w , 24:22 ^w , 24:138 ^w , 24:167 ^w , 24:339 ^w , 24:381 ^w , 26:70, 29:28, 31:30, 32:10, 33:94
41	135 bp 200 bp	800 bp	*68:144 *68:45, 68:117	*32:68 *24:24, 24:67, 24:290, 24:392, 26:16, 33:119
42	130 bp 245 bp	1070 bp	*68:60, 68:99 *68:101	*11:164, 24:394 *03:180
43	255 bp	1070 bp	*68:171N	
44	190 bp	1070 bp	*68:75:01-68:75:02, 68:96, 68:130:01-68:130:02 *68:159Q	*11:11, 43:01
45	270 bp 150 bp 220 bp 265 bp	1070 bp	*68:41 *68:72 *68:86, 68:159Q	*01:126 *26:57, B*39:104
46⁴	110 bp 495 bp	1070 bp	*68:52 *68:142N	*02:396
47⁶	220 bp	1070 bp	*68:01:02:01-68:01:02:07, 68:01:06, 68:01:13, 68:01:15- 68:01:17, 68:01:21-68:01:27, 68:01:30-68:01:31, 68:01:33-68:01:34, 68:01:36- 68:01:37, 68:06-68:07, 68:08:02-68:09, 68:11N-68:12, 68:13:02, 68:16-68:17, 68:19, 68:21:01, 68:23-68:24, 68:30, 68:32-68:33, 68:37-68:38, 68:41, 68:47, 68:52, 68:55:02,	*69:01:02

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48⁸	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-A*68 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.

⁴HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

⁵Primer mixes 1, 17, 29 and 31 may give rise to a lower yield of HLA-specific PCR product than the other HLA-A*68 primer mixes.

⁶Primer mixes 11, 20, 35, 38 and 47 may have tendencies of unspecific amplifications.

⁷Primer mixes 29 and 32 have a tendency to giving rise to primer oligomer formation.

⁸Primer mix 48 contains a negative control, which will amplify more than 95% 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 430 base pairs.

‘w’, may be weakly amplified.

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

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Lot-specific information
PRIMER SPECIFICATION

Well No.	1	2	3	4	5	6	7	8	9	10	11	12
Length of spec. PCR product	200	435	195	180	140	230	145	160	195	165	160	200
				225	235			240	250	190	200	405
Length of int. pos. control ¹	800	1070	1070	1070	800	1070	1070	800	800	800	800	1070
5'-primer(s) ²	127	261	106	102	98	102	145	98	2 nd I	413	98	47
	5'-ggg 3'	5'-AAC 3'	5'-CCA 3'	5'-ACT 3'	5'-CTA 3'	5'-ACT 3'	5'-CCA 3'	5'-CTA 3'	5'-CCT 3'	5'-CCg 3'	5'-CTA 3'	5'-g.T 3'
					397	106	414	418			386	376
					5'-gCC 3'	5'-CCA 3'	5'-gAA 3'	5'-AgC 3'			5'-gTA 3'	5'-gCA 3'
											419	386
											5'-ggT 3'	5'-gTA 3'
3'-primer(s) ³	282	413	259	240	290	292	259	299	479	538	256	282
	5'-gAC 3'	5'-gCC 3'	5'-gTT 3'	5'-ggA 3'	5'-CAA 3'	5'-gTg 3'	5'-gTT 3'	5'-TCA 3'	5'-CCA 3'	5'-CTg 3'	5'-CTC 3'	5'-gAC 3'
	282			282	497		506	539	538	562	538	538
	5'-gAC 3'			5'-gAg 3'	5'-Tgg 3'		5'-TgT 3'	5'-TCC 3'	5'-CAg 3'	5'-gCT 3'	5'-CCA 3'	5'-CCA 3'
	295			292					538			
	5'-TCT 3'			5'-gTg 3'					5'-CAA 3'			
Well No.	1	2	3	4	5	6	7	8	9	10	11	12

Well No.	13	14	15	16	17	18	19	20	21	22	23	24
Length of spec. PCR product	210	400	145	215	175	200	325	90	170	170	185	85
	240		200			225			215			375
Length of int. pos. control ¹	800	1070	1070	1070	1070	800	1070	1070	1070	800	1070	1070
5'-primer(s) ²	2 nd I	28	453	106	395	413	317	362	102	413	413	261
	5'-CCT 3'	5'-TCg 3'	5'-AAA 3'	5'-CCA 3'	5'-gCA 3'	5'-CCg 3'	5'-gCA 3'	5'-gAg 3'	5'-ACT 3'	5'-CCg 3'	5'-CCg 3'	5'-AAC 3'
					413			362	413			
					5'-CCA 3'			5'-gAg 3'	5'-CCA 3'			
3'-primer(s) ³	497	255	555	278	539	570	362	413	275	539	559	307
	5'-TgA 3'	5'-Cgg 3'	5'-CCA 3'	5'-ggC 3'	5'-TCC 3'	5'-CCg 3'	5'-TCA 3'	5'-gCC 3'	5'-CCC 3'	5'-TCC 3'	5'-CgT 3'	5'-CCg 3'
	497		605	282		595			538	546		307
	5'-TgA 3'		5'-gCC 3'	5'-gAg 3'		5'-CCg 3'			5'-CCg 3'	5'-TAA 3'		5'-CCT 3'
	524		616	282		595						355
	5'-CAC 3'		5'-CgC 3'	5'-gAg 3'		5'-CCT 3'						5'-gAC 3'
	545											
	5'-AgA 3'											
Well No.	13	14	15	16	17	18	19	20	21	22	23	24

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

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Lot No.: **4H8**

Lot-specific information

Well No.	25	26	27	28	29	30	31	32	33	34	35	36
Length of spec.	240	100	105	200	80	145	220	120	150	105	140	195
PCR product	365	190	185	230	250	245				165	295	
			235									
Length of int.	1070	1070	1070	1070	800	1070	1070	800	1070	1070	1070	1070
pos. control ¹												
5'-primer(s) ²	28	453	87	121	102	102	2nd I	506	413	160	341	106
	5'-TCg 3'	5'-AAA 3'	5'-ATT 3'	5'-gCT 3'	5'-ACT 3'	5'-ACT 3'	5'-CCT 3'	5'-gCA 3'	5'-CCg 3'	5'-ACT 3'	5'-ggg 3'	5'-CCg 3'
		666	87	349	489	414				217	413	
		5'-gAA 3'	5'-ATA 3'	5'-CTg 3'	5'-gCA 3'	5'-CAg 3'				5'-ggg 3'	5'-CCg 3'	
			217	376								
			5'-ggg 3'	5'-gCA 3'								
			413									
			5'-CCA 3'									
3'-primer(s) ³	97	512	282	282	308	308	506	578	524	282	355	259
	5'-ggT 3'	5'-ACT 3'	5'-gAC 3'	5'-gAC 3'	5'-TCT 3'	5'-TCT 3'	5'-TgC 3'	5'-Tgg 3'	5'-CAA 3'	5'-gAC 3'	5'-gAT 3'	5'-gTT 3'
	224	605	559	538	317	517		595			512	
	5'-TCT 3'	5'-gCC 3'	5'-CAT 3'	5'-CCA 3'	5'-ggA 3'	5'-CgT 3'		5'-CCg 3'			5'-CCT 3'	
		808			527							
		5'-AgA 3'			5'-CCT 3'							
					527							
					5'-CCT 3'							
Well No.	25	26	27	28	29	30	31	32	33	34	35	36

Well No.	37	38	39	40	41	42	43	44	45	46	47
Length of spec.	145	165	95	215	135	130	255	190	150	110	220
PCR product	170		180		200	245		270	220	495	
	285								265		
Length of int.	800	1070	1070	1070	800	1070	1070	1070	1070	1070	1070
pos. control ¹											
5'-primer(s) ²	2 nd I	2 nd I	397	363	98	77	2 nd I	98	98	241	102
	5'-CCT 3'	5'-CCT 3'	5'-gCg 3'	5'-ATg 3'	5'-CTC 3'	5'-CTT 3'	5'-CCT 3'	5'-CTA 3'	5'-CTA 3'	5'-g.C 3'	5'-ACT 3'
			486		736	194		666	413	383	
			5'-ATA 3'		5'-ggA 3'	5'-CgA 3'		5'-gAA 3'	5'-CCg 3'	5'-ggA 3'	
					524						
					5'-CCC 3'						
3'-primer(s) ³	430	453	538	538	259	282	540	256	277	453	282
	5'-gCg 3'	5'-TCg 3'	5'-CCA 3'	5'-CCA 3'	5'-gTT 3'	5'-gAC 3'	5'-CTT 3'	5'-CCC 3'	5'-ggT 3'	5'-TCT 3'	5'-gAC 3'
	457				831	616		257	311		
	5'-gTA 3'				5'-TCC 3'	5'-CgT 3'		5'-gCA 3'	5'-ggA 3'		
	570							325	325		
	5'-CCg 3'							5'-gTA 3'	5'-gTA 3'		
								809	521		
								5'-CAT 3'	5'-ggA 3'		
Well No.	37	38	39	40	41	42	43	44	45	46	47

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.

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

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Lot No.: 4H8

Lot-specific information

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.

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

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Lot No.: **4H8**

Lot-specific information

CELL LINE VALIDATION SHEET																			
HLA-A*68 SSP subtyping kit ²																			
			Prod. No.:	Well															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
				201672501	201672502	201672503	201672504	201672505	201672506	201672507	201672508	201672509	201672510	201672511	201672512	201903113	201672514	201672515	201672516
	IHWC cell line ¹	A*																	
1	9001 SA	*24:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280 LK707	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011 E4181324	*01:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275 GU373	*30:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009 KAS011	*01:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353 SM	*02:01	*26:03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	9020 QBL	*26:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9025 DEU	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026 YAR	*26:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107 LKT3	*24:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051 PITOUT	*29:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052 DBB	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004 JESTHOM	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071 OLGA	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075 DKB	*24:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037 SWEIG007	*29:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282 CTM3953540	*03:01	*80:01	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257 32367	*33:03	*74:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038 BM16	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059 SLE005	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064 AMALA	*02:17		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056 KOSE	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124 IHL	*02:01	*34:01	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035 JBUSH	*32:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049 IBW9	*33:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285 WT49	*02:05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191 CH1007	*24:10	*29:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	9320 BEL5GB	*02:01	*29:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050 MOU	*29:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021 RSH	*30:01	*68:02	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
31	9019 DUCAF	*30:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297 HAG	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098 MT14B	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302 SSTO	*32:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024 KT17	*02:06	*11:01	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
37	9065 HHKB	*03:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099 LZL	*02:17		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315 CML	*01:01	*03:01	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134 WHONP199	*02:07	*30:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055 H0301	*03:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066 TAB089	*02:07		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076 T7526	*02:06	*02:07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057 TEM	*66:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239 SHJO	*23:01	*24:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	9013 SCHU	*03:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045 TUBO	*02:16	*03:01	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	9303 TER-ND	*02:01	*11:01	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

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Lot No.: **4H8**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-A*68 SSP subtyping kit ²																				
			Prod. No.:	Well																
				17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
				201672517	201672518	201672519	201672520	201672521	201672522	201672523	201672524	201903125	201903126	201672527	201672528	201672529	201672530	201672531	201672532	
	IHWC cell line ¹	A*																		
1	9001 SA	*24:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280 LK707	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011 E4181324	*01:01		-	+	-	-	-	W	-	-	-	-	-	-	-	-	-	-	-
4	9275 GU373	*30:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009 KAS011	*01:01		-	+	-	-	-	W	-	-	-	-	-	-	-	-	-	-	-
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 OLG A	*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		W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191 CH1007	*24:10	*29:01	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
28	9320 BEL5GB	*02:01	*29:02	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
29	9050 MOU	*29:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
30	9021 RSH	*30:01	*68:02	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	9019 DUCAF	*30:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297 HAG	*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098 MT14B	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302 SSTO	*32:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024 KT17	*02:06	*11:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065 HHKB	*03:01		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
38	9099 LZL	*02:17		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315 CML	*01:01	*03:01	-	+	-	-	-	W	+	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

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Lot No.: **4H8**

Lot-specific information

CELL LINE VALIDATION SHEET																			
HLA-A*68 SSP subtyping kit ²																			
				Well															
				33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
				Prod. No.:	201672533	201672534	201672535	201672536	201903137	201672538	201672539	201672540	201891941	201672542	201903143	201891944	201891945	201672546	201672547
	IHWC cell line ¹		A*																
1	9001 SA		*24:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280 LK707		*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011 E4181324		*01:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275 GU373		*30:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009 KAS011		*01:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353 SM		*02:01	*26:03	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
7	9020 QBL		*26:01		-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
8	9025 DEU		*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026 YAR		*26:01		-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
10	9107 LKT3		*24:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051 PITOUT		*29:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052 DBB		*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004 JESTHOM		*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071 OLGA		*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075 DKB		*24:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037 SWEIG007		*29:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282 CTM3953540		*03:01	*80:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257 32367		*33:03	*74:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038 BM16		*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059 SLE005		*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064 AMALA		*02:17		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056 KOSE		*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124 IHL		*02:01	*34:01	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
24	9035 JBUSH		*32:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049 IBW9		*33:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285 WT49		*02:05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191 CH1007		*24:10	*29:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	9320 BEL5GB		*02:01	*29:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050 MOU		*29:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021 RSH		*30:01	*68:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	9019 DUCAF		*30:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297 HAG		*02:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098 MT14B		*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF		*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302 SSTO		*32:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024 KT17		*02:06	*11:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065 HHKB		*03:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099 LZL		*02:17		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315 CML		*01:01	*03:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134 WHONP199		*02:07	*30:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055 H0301		*03:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066 TAB089		*02:07		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076 T7526		*02:06	*02:07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057 TEM		*66:01		-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
45	9239 SHJO		*23:01	*24:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	9013 SCHU		*03:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045 TUBO		*02:16	*03:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	9303 TER-ND		*02:01	*11:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

Visit <https://labproducts.caredx.com> for
“Instructions for Use” (IFU)

Lot No.: **4H8**

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.

No DNAs carrying the alleles to be amplified by primer solutions 5, 7 to 9, 11 to 16, 19 to 21, 25, 26, 28, 32, 33, 35, 37, 39, 41 to 43, 45 and 46 were available.

The specificities of the primers in primer solutions 5, 7 to 9, 11, 13, 15, 16, 20, 21, 25, 26, 35, 37 and 41 were tested by separately adding additional 5'-primers, respectively additional 3'-primers.

In primer solutions 12, 19, 28, 39, 42 and 46 it was only possible to test the 3'-primers, the 5'-primers were not possible to test.

In primer solutions 14, 32, 33, 43 and 45 it was only possible to test the 5'-primers, the 3'-primers were not possible to test.

In primer solutions 5, 7, 8, 11, 17, 27, 34, 35 and 41 one or two of the 5'-primers were not possible to test.

In primer solutions 1, 8 to 10, 13, 15, 16, 18, 21, 22, 24 to 27, 35, 37 and 44 one, two or three of the 3'-primers were not possible to test.

Additional primers in primer solutions 4, 6, 27, 29 and 44 were tested tested by separately adding either one or two additional 5'-primers, or one additional 3'-primer.

101.418-12/04 – including *Taq* pol., IFU-01
101.418-12u/04 – without *Taq* pol., IFU-02

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Lot-specific information

101.418-12/04 – including *Taq* pol., IFU-01
 101.418-12u/04 – without *Taq* pol., IFU-02

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 “Instructions for Use” (IFU)

Lot No.: **4H8**

Lot-specific information

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