

101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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

Lot No.: **3R4**

Lot-specific information

Olerup SSP[®] HLA-A*11

Product number:	101.416-12/04 – including <i>Taq</i> pol. 101.416-12u/04u – without <i>Taq</i> pol.
Lot number:	3R4
Expiry date:	2026-11-01
Number of tests:	12 tests – Product No. 101.416-12/12u 4 tests – Product No. 101.416-04/04u
Number of wells per test:	63+1
Storage - pre-aliquoted primers:	dark, between -15°C and -25°C
- PCR Master Mix:	between -15°C and -25°C
- Adhesive PCR seals	RT

This Product Description is only valid for Lot No. 3R4.

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*11 Lot (6L8)

- The product documentation has been updated for new alleles of IMGT 3.49.0.
- The kit resolution focuses on common and well documented (CWD) alleles¹.

¹As described in section Uniquely Identified Alleles.

The HLA-A*11 primer set, specificity and interpretation tables have been updated for the HLA-A alleles described since the previous *Olerup SSP[®]* HLA-A*11 lot was made (**Lot No. 6L8**).

The HLA-A*11 primer set is unchanged compared to the previous *Olerup SSP[®]* HLA-A*11 (**Lot No. 6L8**).

¹S. J. Mack, P. Cano, J. A. Hollenbach et al.
 Common and well-documented HLA alleles: 2012 update to
 the CWD catalogue. Tissue Antigens, 2013, 81, 194–203



0197

For *In Vitro* Diagnostic Use
 MA123 v02 SSP PI Template
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Well **64** 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.



0197

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Lot-specific information

PRODUCT DESCRIPTION

HLA-A*11 SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for identifying the HLA-A*11:01 to A*11:428 alleles.

PLATE LAYOUT

Each test consists of 64 PCR reactions in a 64 well cut PCR plate.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	NC

The 64 well cut PCR plate is marked with ‘HLA-A*11’ in silver/gray ink.

Well No. 1 is marked with Lot No ‘3R4’.

Wells 1 to 63 – HLA-A*11 high resolution primers.

Well 64 – 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 covered with a PCR-compatible foil.

INTERPRETATION

Due to the sharing of sequence motifs between HLA-A alleles non-HLA-A*11 alleles will be amplified by some primer mixes. For further details see Specificity Table.

UNIQUELY IDENTIFIED ALLELES

All the HLA-A*11 alleles, i.e. **A*11:01 to A*11:428**, recognized by the HLA Nomenclature Committee in July 2022^{1,2} will be amplified by the primers in the HLA-A*11 SSP kit³.

The HLA-A*11 kit enables separation of the confirmed HLA-A*11 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*11 alleles is listed below.



0197

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Lot-specific information

The HLA-A*11 kit also enables identification of many null and alternatively expressed alleles.

The following HLA-A*11 alleles can be distinguished by the different sizes of the HLA-specific PCR product:

Alleles	Primer mix	Alleles	Primer mix
A*11:01:57, 11:59	41	A*11:79, 11:129	45
A*11:09, 11:196	8	A*11:81, 11:108	52
A*11:13, 11:117	16	A*11:86, 11:142	50
A*11:58, 11:67	34	A*11:99N, 11:112	56
A*11:62, 11:68	35	A*11:115N, 11:180N	58
A*11:63, 11:69N	42	A*11:120, 11:171	63
A*11:64-11:65:02, 11:193	36	A*11:124, 11:174	59
A*11:66, 11:72, 11:359	37	A*11:127N, 11:137:01N- 11:137:02N	60

¹HLA-A alleles listed on the IMGT/HLA web page 2022-July-12, release 3.49.0, www.ebi.ac.uk/imgt/hla.

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

³The HLA-*11 primer set cannot separate the following alleles. These alleles can be distinguished by the HLA-A low resolution kit.

Alleles

A*11:250, 24:555



0197

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ALLELE CONFIRMATION STATUS

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



0197

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Allele	Status ¹	Allele	Status ¹	Allele	Status ¹	Allele	Status ¹
A*11:119:01	Unconfirmed	A*11:157	Unconfirmed	A*11:197	Unconfirmed	A*11:236	Unconfirmed
A*11:119:02	Unconfirmed	A*11:158	Unconfirmed	A*11:198	Unconfirmed	A*11:237	Unconfirmed
A*11:120	Unconfirmed	A*11:159	Unconfirmed	A*11:199:01	Confirmed	A*11:238N	Unconfirmed
A*11:121	Unconfirmed	A*11:160	Unconfirmed	A*11:199:02	Unconfirmed	A*11:239	Unconfirmed
A*11:122	Unconfirmed	A*11:161	Unconfirmed	A*11:200	Unconfirmed	A*11:240	Unconfirmed
A*11:123	Unconfirmed	A*11:162	Unconfirmed	A*11:201	Unconfirmed	A*11:241	Unconfirmed
A*11:124	Unconfirmed	A*11:163	Confirmed	A*11:202	Unconfirmed	A*11:242	Unconfirmed
A*11:125	Unconfirmed	A*11:164	Unconfirmed	A*11:203	Unconfirmed	A*11:243	Unconfirmed
A*11:126	Confirmed	A*11:165	Unconfirmed	A*11:204	Unconfirmed	A*11:244	Unconfirmed
A*11:127N	Unconfirmed	A*11:166	Confirmed	A*11:205	Unconfirmed	A*11:245	Unconfirmed
A*11:128	Confirmed	A*11:167	Unconfirmed	A*11:206	Unconfirmed		
A*11:129	Confirmed	A*11:168	Unconfirmed	A*11:207	Unconfirmed		
A*11:130	Unconfirmed	A*11:169	Unconfirmed	A*11:208N	Confirmed		
A*11:131	Confirmed	A*11:170Q	Unconfirmed	A*11:209	Unconfirmed		
A*11:132	Unconfirmed	A*11:171	Unconfirmed	A*11:210N	Unconfirmed		
A*11:133	Unconfirmed	A*11:172	Unconfirmed	A*11:211	Confirmed		
A*11:134	Confirmed	A*11:173	Unconfirmed	A*11:212	Unconfirmed		
A*11:135	Confirmed	A*11:174	Unconfirmed	A*11:213	Unconfirmed		
A*11:136	Unconfirmed	A*11:175	Unconfirmed	A*11:214	Unconfirmed		
A*11:137N	Unconfirmed	A*11:176	Unconfirmed	A*11:215N	Unconfirmed		
A*11:138	Unconfirmed	A*11:177	Unconfirmed	A*11:216	Unconfirmed		
A*11:139	Unconfirmed	A*11:178	Unconfirmed	A*11:217	Unconfirmed		
A*11:140	Unconfirmed	A*11:179	Unconfirmed	A*11:218	Unconfirmed		
A*11:141	Unconfirmed	A*11:180N	Unconfirmed	A*11:219	Confirmed		
A*11:142	Unconfirmed	A*11:181	Unconfirmed	A*11:220	Unconfirmed		
A*11:143	Unconfirmed	A*11:182Q	Unconfirmed	A*11:221	Unconfirmed		
A*11:144	Unconfirmed	A*11:183	Confirmed	A*11:222	Unconfirmed		
A*11:145	Unconfirmed	A*11:184	Unconfirmed	A*11:223	Confirmed		
A*11:146	Unconfirmed	A*11:185	Unconfirmed	A*11:224	Unconfirmed		
A*11:147	Unconfirmed	A*11:186	Unconfirmed	A*11:225	Unconfirmed		
A*11:148	Unconfirmed	A*11:187	Unconfirmed	A*11:226	Unconfirmed		
A*11:149	Unconfirmed	A*11:188	Unconfirmed	A*11:227	Unconfirmed		
A*11:150	Unconfirmed	A*11:189	Confirmed	A*11:228	Unconfirmed		
A*11:151	Unconfirmed	A*11:190	Confirmed	A*11:229	Unconfirmed		
A*11:152	Unconfirmed	A*11:191	Unconfirmed	A*11:230	Unconfirmed		
A*11:153:01	Unconfirmed	A*11:192	Unconfirmed	A*11:231	Unconfirmed		
A*11:153:02	Confirmed	A*11:193	Confirmed	A*11:232	Unconfirmed		
A*11:154	Unconfirmed	A*11:194	Unconfirmed	A*11:233	Unconfirmed		
A*11:155	Confirmed	A*11:195	Unconfirmed	A*11:234	Unconfirmed		
A*11:156	Confirmed	A*11:196	Confirmed	A*11:235Q	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*11 homo- and heterozygotes is available upon request.



0197

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SPECIFICITY TABLE

HLA-A*11 SSP subtyping

Specificities and sizes of the PCR products of the 63+1 primer mixes used for
 HLA-A*11 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified HLA-A*11 alleles ³	Other amplified HLA-A alleles
1	195 bp	800 bp	*11:01:01:01-11:01:119, 11:03:01:01-11:13, 11:15:01-11:15:02, 11:20-11:27, 11:29- 11:37, 11:39, 11:41- 11:44, 11:46-11:52Q, 11:54:01-11:56, 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, 11:148:01-11:160, 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, 11:288-11:296, 11:298-11:304, 11:306- 11:307, 11:309-11:311, 11:313Q-11:343, 11:345, 11:347N-11:349, 11:351Q-11:371, 11:373- 11:379, 11:381-11:395, 11:397N-11:410, 11:412, 11:414-11:428	*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, 02:741, 02:907, 03:01:01:01- 03:01:08, 03:01:10-03:01:22, 03:01:24- 03:01:93, 03:01:95-03:07:02, 03:09-03:31, 03:33-03:35, 03:37-03:40, 03:42- 03:56:01:02, 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, 03:195-03:197:02N, 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, 03:274-03:329N, 03:331-03:381N, 03:383-03:397, 03:399- 03:412, 03:414-03:428, 03:430, 03:432- 03:442, 03:444-03:448N, 24:19, 24:290, 24:406, 29:159, 29:172, 30:18, 30:55, 31:89, 31:115, 33:125, 33:131, 34:01:01:01-34:13, 34:15-34:20, 34:22-34:26N, 34:28-34:30N, 66:01:01:01-66:02:01:03, 66:04, 66:06- 66:10, 66:12-66:14, 66:16-66:27N, 66:29- 66:38, 66:40-66:46, 68:01:01:01-68:01:28, 68:01:30-68:01:37, 68:01:39-68:02:20, 68:02:22-68:02:23, 68:06-68:14, 68:16- 68:19, 68:21:01-68:30, 68:32-68:35:01:02, 68:37-68:45, 68:47-68:56:02, 68:58:01- 68:83, 68:85-68:89, 68:91, 68:93-68:108, 68:110-68:135, 68:137-68:179, 68:181N- 68:205N, 68:207-68:226, 68:228-68:248, 68:250-68:254, 68:256-68:268, 68:270- 68:284, 68:286-68:291, 68:293Q-68:294, 69:01:01:01-69:09, 74:13, C*03:82
2	270 bp	1070 bp	*11:02:01:01-11:02:07, 11:14, 11:16, 11:38, 11:57, 11:77, 11:101, 11:110, 11:113, 11:140, 11:147, 11:176, 11:201, 11:255-11:256Q, 11:262, 11:281, 11:297, 11:308, 11:346, 11:372, 11:411	
	305 bp		*11:272Q	



0197

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Lot-specific information

3	190 bp	1070 bp	*11:03:01:01, 11:33:01-11:33:02, 11:175, 11:191, 11:348, 11:381	*01:61, 03:22:01-03:22:02, 03:42, 03:135, 03:225, 03:248, 03:274, 03:280:01-03:280:02, 25:43, 30:01:01:01-30:04:04, 30:06-30:20, 30:22-30:27N, 30:29-30:34, 30:36-30:46, 30:48-30:51, 30:53, 30:55-30:71, 30:73N-30:79, 30:81-30:85, 30:88, 30:90-30:112, 30:114-30:130N, 30:132N-30:179, 30:181-30:202, 31:03-31:04:02, 31:176, 31:179, 33:49, 33:144, 34:02:01:01 ^w -34:02:07 ^w , 34:03, 34:04 ^w , 34:07 ^w -34:10N ^w , 34:13 ^w , 34:15 ^w , 34:20 ^w -34:22 ^w , 34:24 ^w -34:26N ^w , 34:28 ^w -34:30N ^w , 74:23
4	235 bp	1070 bp	*11:04, 11:27, 11:35, 11:130, 11:209	*01:12, 01:14, 01:19, 01:200, 01:244, 01:391, 02:156, 02:338, 02:952, 03:01:01:01-03:01:05, 03:01:07-03:01:29, 03:01:31-03:01:48, 03:01:51-03:01:89, 03:01:91-03:17:02, 03:19-03:39, 03:41-03:74, 03:76-03:94, 03:96-03:97, 03:99-03:104, 03:106-03:134, 03:136-03:176, 03:178N-03:193, 03:195-03:199, 03:201-03:203, 03:205-03:207, 03:209-03:214, 03:216-03:248, 03:250-03:259, 03:261-03:287, 03:289:01-03:321, 03:323N-03:325, 03:327-03:342N, 03:344-03:346, 03:348-03:376, 03:378-03:413, 03:415-03:448N, 24:92, 24:458, 24:551, 24:557, 30:01:01:01-30:04:04, 30:06-30:13, 30:15-30:20, 30:22-30:27N, 30:29-30:42, 30:44-30:46, 30:48-30:51, 30:53-30:71, 30:73N-30:79, 30:81-30:112, 30:114-30:116, 30:118-30:130N, 30:132N-30:164, 30:166-30:179, 30:181-30:201, 30:203, 31:03-31:04:02, 31:176, 31:179, 32:04, 33:49, 33:144, 34:02:01:01-34:04, 34:07-34:10N, 34:13, 34:15, 34:20-34:22, 34:24-34:26N, 34:28-34:30N, 36:01:01:01-36:02, 36:05-36:12, 68:103:01-68:103:02, 74:23, 80:03
5	180 bp 210 bp	800 bp	*11:05, 11:248 *11:110	*02:294, 30:187, 32:54, 32:142, 33:204, 66:08, 68:206, B*44:02:62
6	190 bp 550 bp	1070 bp	*11:07:01, 11:22 *11:06, 11:18, 11:312	*01:79 ^w *01:104 ^w , 01:134 ^w , 01:229 ^w , 01:405 ^w , 02:38, 02:101:01, 02:135, 02:154, 02:447, 02:543, 02:838, 02:848 ^w , 02:883 ^w , 02:1002, 25:11, 26:03:01:01-26:03:01:02, 26:06, 26:21, 26:30, 26:36, 26:92, 26:111, 26:146, 26:177, 26:193
7⁶	210 bp	1070 bp	*11:08, 11:44, 11:50Q, 11:94, 11:155, 11:183, 11:191, 11:211, 11:226, 11:269, 11:271, 11:290, 11:326	*01:01:01:01-01:01:57, 01:01:59-01:02:02, 01:04:01:01N-01:04:01:02N, 01:07-01:11N, 01:13-01:18N, 01:21-01:33, 01:35-01:40, 01:42-01:62, 01:64-01:65, 01:67:01-01:72, 01:74-01:88:03, 01:90-01:129, 01:131-01:135, 01:137-01:191, 01:193-01:199, 01:201-01:243, 01:245-01:254,



0197

101.416-12/04 – including *Taq* polymerase
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 “Instructions for Use” (IFU)

Lot No.: **3R4**

Lot-specific information

				01:256-01:286, 01:288-01:300, 01:302-01:306, 01:308N-01:314, 01:316-01:339, 01:341-01:349, 01:351-01:354, 01:356-01:359, 01:361N-01:379N, 01:381-01:419, 03:18, 03:50, 03:66, 03:135, 03:153, 03:187, 03:225, 25:43, 25:59, 30:04:01:01-30:04:04, 30:06, 30:17, 30:29, 30:46, 30:77, 30:90, 30:103, 30:105, 30:117, 30:139, 30:150, 30:155, 36:01:01:01-36:02, 36:04-36:12, 68:103:01-68:103:02
8⁴	100 bp	800 bp	*11:09, 11:34	*01:205, 01:364, 02:911, 02:914, 24:377, 26:75
	175 bp		*11:196, 11:201	*01:129, 02:221, 23:41, 24:286, 29:15, 30:162, 31:78, 66:44
9^{4,5,7}	85 bp	800 bp	*11:27, 11:38-11:39, 11:94	*01:26, 01:136, 01:192, 24:59, 24:285, 24:395, 24:503
10⁴	120 bp	1070 bp	*11:10	*01:51, 02:644, 02:741, 25:01:01:01-25:12N, 25:14-25:38, 25:40-25:45, 25:47-25:58, 25:60-25:63, 25:65-25:76, 25:78-25:80, 26:01:01:01-26:01:51, 26:01:53-26:06, 26:08:01:01-26:18, 26:20:01-26:29, 26:32-26:43:02, 26:45-26:64, 26:66-26:71N, 26:73-26:75, 26:77-26:91, 26:93-26:113, 26:115-26:131, 26:133-26:169, 26:171-26:183, 26:185-26:192, 26:195-26:223, 33:13, 33:184, 34:01:01:01-34:08, 34:10N-34:18, 34:20-34:22, 34:25-34:30N, 66:01:01:01-66:01:07, 66:04-66:11, 66:13-66:15, 66:17-66:20, 66:22, 66:24, 66:27N, 66:29-66:33, 66:35-66:38, 66:40-66:41, 66:44-66:46, 68:227, 69:02, B*07:102, B*08:18, B*15:357, B*18:115, B*35:178, B*35:282, B*35:316, B*38:79, B*51:241, B*73:01:01:01-73:03, C*06:147
	280 bp		*11:43, 11:385	*01:143, 26:35, 26:177, 26:207, 29:66, 31:03, 31:164, 33:13, 33:184, C*07:449
11	165 bp	800 bp	*11:01:01:01-11:01:56, 11:01:58-11:07:02, 11:09-11:21N, 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, 11:54:01-11:58, 11:60-11:93, 11:95-11:112, 11:114-11:115N, 11:117-11:139, 11:141-11:157, 11:159-11:161, 11:163-11:182Q, 11:184-11:190, 11:192-11:210N, 11:212-11:215N, 11:217-11:225, 11:227-11:255, 11:257-11:268, 11:270, 11:272Q-11:289,	*01:12, 01:19, 01:25, 01:127, 01:136, 01:360, 01:380:01:01-01:380:01:02, 02:662, 03:02:01:01-03:02:06, 03:10, 03:31-03:32, 03:65, 03:69N, 03:73, 03:76, 03:90, 03:106, 03:113, 03:160, 03:167, 03:198, 03:218, 03:223, 03:237, 03:242, 03:244, 03:253, 03:274-03:275N, 03:281, 03:285, 03:309, 03:314, 03:318-03:319, 03:333, 03:348, 03:356, 03:385, 24:17:01:01-24:17:01:02, 24:41, 24:208:01-24:208:02:02, 24:296, 24:488, 24:499, 24:503, 24:535, 24:551, 24:555, 24:557, 29:05, 29:33, 29:77, 29:87, 29:104, 68:09, 68:26, 68:129, 68:134, 68:171:02N, 68:204, C*16:67



0197

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Lot No.: **3R4**

Lot-specific information

			11:291-11:325, 11:327-11:345, 11:347N-11:371, 11:373-11:428	
12	240 bp	1070 bp	*11:01:01:01-11:01:03, 11:01:05-11:01:20, 11:01:22-11:01:43, 11:01:45-11:01:61, 11:01:63-11:03:01:01, 11:05-11:25:02, 11:29-11:34, 11:36-11:47, 11:49, 11:51-11:52Q, 11:54:01-11:89, 11:91:01-11:100, 11:102-11:117, 11:119:01-11:129, 11:131-11:138, 11:140-11:142, 11:144-11:156, 11:157 ^w , 11:158-11:169, 11:171-11:181, 11:183-11:208:02N, 11:210N-11:241, 11:243-11:263, 11:265-11:287N, 11:289-11:298, 11:300-11:329, 11:331-11:371, 11:373-11:428	*01:01:01:01-01:01:22, 01:01:24-01:01:47, 01:01:49-01:01:78, 01:01:80-01:02:02, 01:04:01:01N-01:04:01:02N, 01:06-01:07, 01:09:01:01-01:11N, 01:13, 01:15N-01:18N, 01:21-01:33, 01:35-01:40, 01:42-01:62, 01:64-01:65, 01:67:01-01:72, 01:74-01:88:03, 01:90-01:129, 01:131-01:146, 01:148, 01:150-01:158, 01:160N-01:177, 01:179N-01:191, 01:193-01:199, 01:201-01:207, 01:209-01:243, 01:245-01:254, 01:256-01:286, 01:288-01:300, 01:302-01:306, 01:308N-01:313, 01:316-01:339, 01:341-01:349, 01:351-01:354, 01:356-01:390, 01:392-01:395, 01:397-01:402, 01:404-01:419, 03:18, 03:135, 24:555, 25:43, 25:59, 30:117, 36:04
13⁷	195 bp	800 bp	*11:11	*43:01-43:03, 68:130:01
14^{4,6}	100 bp	1070 bp	*11:01:01:01-11:01:72, 11:01:74-11:01:75, 11:01:77-11:11, 11:13-11:16, 11:20-11:27, 11:29-11:39, 11:41-11:52Q, 11:54:01-11:60, 11:61 ^w , 11:62-11:95, 11:97, 11:99N-11:105, 11:107-11:120, 11:122-11:155, 11:156 ^w , 11:157-11:158, 11:160-11:177, 11:179-11:223, 11:224 ^w , 11:225-11:249, 11:251N-11:290, 11:292-11:300, 11:302:01-11:307, 11:309-11:311, 11:313Q-11:324, 11:326-11:398, 11:400N-11:428	*01:13, 01:17, 01:176, 01:302, 02:741 ^w , 03:63, 03:88, 03:382, 25:02, 25:75, 26:13, 26:19, 26:33, 29:66, 30:125, 30:140, 34:01:01:01 ^w -34:01:07 ^w , 34:02:01:01-34:04, 34:05 ^w , 34:06, 34:08, 34:10N, 34:11 ^w -34:12 ^w , 34:13, 34:14 ^w , 34:15, 34:16 ^w -34:18 ^w , 34:19-34:22, 34:23 ^w , 34:24-34:26N, 34:27 ^w , 34:28-34:30N, 66:01:01:01-66:01:07, 66:04, 66:06-66:11, 66:13-66:14, 66:17-66:20, 66:22-66:24, 66:27N, 66:29-66:33, 66:35-66:38, 66:40-66:42, 66:44-66:46, 68:227, 69:02
15⁴	100 bp	800 bp	*11:12:01-11:12:02	*01:194, 02:34 ^w -02:35:03 ^w , 02:56:01-02:56:02, 02:62, 02:78, 02:103, 02:580 ^w , 02:907 ^w , 03:01:01:01-03:01:09, 03:01:11-03:07:02, 03:09-03:22:02, 03:23:01 ^w -03:23:02 ^w , 03:24-03:28, 03:31, 03:33, 03:35, 03:37-03:40, 03:42-03:61, 03:64-03:87, 03:90-03:106, 03:109-03:112, 03:113 ^w , 03:114-03:151, 03:153-03:156, 03:157:01 ^w -03:157:02 ^w , 03:158-03:171, 03:173-03:175, 03:177-03:193, 03:195-03:197:02N, 03:199, 03:201-03:259, 03:261-03:262N, 03:264-03:272, 03:274-03:381N, 03:383-03:397,



0197

101.416-12/04 – including *Taq* polymerase
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Lot No.: **3R4**

Lot-specific information

215 bp	*11:24:02-11:25:01, 11:31, 11:35, 11:158	03:399-03:412, 03:414-03:446, 03:448N, 24:24, 24:290, 29:01:01:01-29:02:16, 29:02:17:01 ^w -29:02:17:02 ^w , 29:02:18-29:03, 29:04 ^w , 29:05-29:18, 29:21-29:29, 29:31- 29:33, 29:35-29:47, 29:49-29:65, 29:67- 29:73, 29:75-29:97, 29:99-29:105, 29:107- 29:140, 29:142-29:172, 30:01:01:01- 30:01:21, 30:08:01-30:08:02, 30:11:01- 30:11:02, 30:14L-30:20, 30:23-30:26, 30:30, 30:35-30:43, 30:48-30:49, 30:52-30:56, 30:58-30:59N, 30:60 ^w , 30:62-30:63, 30:65, 30:71-30:75, 30:78N-30:79, 30:81-30:83, 30:86-30:89, 30:91-30:98, 30:102, 30:104, 30:106, 30:109-30:116, 30:118, 30:120, 30:122-30:123N, 30:126, 30:128-30:132N, 30:134-30:138, 30:141-30:143, 30:145N, 30:147-30:148, 30:154, 30:159, 30:161, 30:163-30:165, 30:167-30:168, 30:170- 30:173, 30:176, 30:178N-30:181, 30:183- 30:187, 30:190-30:192, 30:194-30:197N, 30:199, 30:201-30:203, 31:89, 31:115, 32:17, 33:125, 33:131, 34:09, 66:02:01:01- 66:02:01:03, 66:12, 66:16, 66:21, 66:25- 66:26Q, 66:34, 66:43, 68:01:01:01-68:01:17, 68:01:19-68:01:56, 68:01:58-68:02:19, 68:02:21-68:02:22, 68:06-68:14, 68:16- 68:19, 68:21:01-68:23, 68:25-68:30, 68:32- 68:39, 68:41-68:71, 68:73-68:84, 68:86- 68:89, 68:91-68:92, 68:94N-68:96, 68:98- 68:108, 68:110-68:122, 68:124-68:126, 68:127 ^w , 68:128-68:179, 68:181N-68:205N, 68:207-68:211, 68:213N-68:226, 68:228- 68:248, 68:250-68:254, 68:256-68:294, 69:01:01:01-69:01:04, 69:03-69:07, 69:09, 74:13, 74:42 *01:06, 01:200, 01:244, 02:156, 02:338, 02:952, 03:01:01:01-03:01:01:115, 03:01:03:01-03:01:05, 03:01:07-03:01:48, 03:01:50-03:01:114, 03:03N-03:05:01, 03:07:01:01-03:07:01:02, 03:08:01:01- 03:09, 03:11N-03:17:02, 03:19-03:30, 03:33- 03:49, 03:51:01-03:64, 03:67-03:68N, 03:70- 03:72, 03:74, 03:77-03:81, 03:83-03:89:02, 03:91N-03:94, 03:96-03:105, 03:107-03:112, 03:114-03:134, 03:136-03:149, 03:151- 03:152, 03:154:01-03:159, 03:161N-03:166, 03:168N-03:176, 03:178N-03:186, 03:188- 03:193, 03:195-03:197:02N, 03:199, 03:201- 03:203, 03:205-03:207, 03:209-03:214, 03:216-03:217, 03:219-03:222, 03:224, 03:226-03:228, 03:230, 03:231:02-03:235, 03:238-03:241, 03:243, 03:245-03:248, 03:250-03:252, 03:254-03:259, 03:261- 03:265, 03:267-03:273, 03:276-03:280:01, 03:282-03:284N, 03:286N-03:287,
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0197

101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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Lot No.: **3R4**

Lot-specific information

				03:289:01-03:308, 03:310-03:313, 03:315-03:317, 03:320-03:321, 03:323N-03:332, 03:334N-03:342N, 03:344-03:346, 03:349-03:355, 03:357N-03:376, 03:378-03:384, 03:386-03:413, 03:415, 03:417-03:448N, 30:01:01:01-30:02:04, 30:02:06-30:03, 30:07-30:16, 30:18-30:20, 30:22-30:27N, 30:30-30:45, 30:48-30:51, 30:53-30:71, 30:73N-30:76N, 30:78N-30:79, 30:81-30:89, 30:91-30:98, 30:100-30:102, 30:104, 30:106-30:112, 30:114-30:116, 30:118-30:130N, 30:132N-30:138, 30:140-30:149, 30:151-30:154, 30:156-30:163, 30:165-30:179, 30:181-30:203, 31:03-31:04:02, 31:176, 31:179, 32:04, 33:49, 33:144, 34:02:01:01-34:02:01:08, 34:02:03-34:04, 34:07-34:10N, 34:13, 34:15, 34:20-34:22, 34:24-34:26N, 34:28-34:30N, 74:23
16 ^{4,5,7}	95 bp 210 bp	1070 bp	*11:13 *11:07:01, 11:26, 11:54:01, 11:117	*01:140:02 ^w , 01:221 ^w , 02:38, 02:101:01, 02:154, 02:447, 02:543, 02:838, 02:848 ^w , 02:883 ^w , 02:1002, 03:18 ^w , 03:135 ^w , 23:10:01 ^w , 23:110, 24:10:01:01-24:10:02, 24:46 ^w , 24:210, 24:300, 24:340, 24:494-24:495, 24:506, 24:528 ^w , 25:10, 25:43, 26:176, 26:204:01:01-26:204:01:02, 29:156, 30:117, 31:24, 31:200 ^w , 33:61, 33:190, 68:134, 69:09 ^w
17	205 bp	1070 bp	*11:14, 11:50Q, 11:290	*01:10, 03:231:01-03:231:02, 30:01:01:01-30:01:06, 30:01:08-30:03, 30:07-30:08:02, 30:10-30:16, 30:18-30:20, 30:22, 30:24-30:26, 30:30-30:45, 30:48-30:51, 30:53-30:71, 30:73N-30:76N, 30:78N-30:79, 30:81-30:88, 30:91-30:98, 30:100-30:102, 30:104, 30:106-30:112, 30:114-30:116, 30:118-30:130N, 30:132N-30:138, 30:140-30:149, 30:151-30:154, 30:156-30:171, 30:173-30:179, 30:181-30:182, 30:184Q-30:203, 80:01:01:01-80:09N
18	225 bp 240 bp	1070 bp	*11:47, 11:221 *11:15:01, 11:170Q	*01:279, 03:289:02, 30:39:01
19 ⁴	100 bp 175 bp 265 bp	800 bp	*11:134 *11:42 *11:46, 11:215N	*68:147 B*39:75, B*40:268 *66:27N, 68:242, B*07:111N, B*37:64
20	180 bp 235 bp	800 bp	*11:42, 11:131 *11:17, 11:40, 11:223, 11:271	B*39:75, B*40:268 *01:43, 25:59, 26:01:01:01-26:01:29, 26:01:31-26:01:53, 26:01:55-26:01:62, 26:01:64-26:02:02, 26:04, 26:07:01-26:15, 26:17-26:19, 26:22-26:29, 26:31-26:34, 26:36-26:43:02, 26:45-26:56, 26:58-26:77, 26:79-26:91, 26:93-26:110, 26:112:01-26:136, 26:138-26:176, 26:178-26:192, 26:194-26:206:02N, 26:208-26:223, 43:01-43:03, 68:227



0197

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Lot No.: **3R4**

Lot-specific information

<p>21^{4,6}</p>	<p>100 bp</p>	<p>1070 bp</p>	<p>*11:17, 11:19, 11:40, 11:98, 11:121, 11:308, 11:312</p>	<p>*01:01:01:01-01:01:27, 01:01:29-01:01:56, 01:01:58-01:01:61, 01:01:63-01:01:106, 01:01:108-01:01:123, 01:01:125- 01:04:01:02N, 01:06, 01:08-01:12, 01:14- 01:16N, 01:18N-01:33, 01:35-01:70, 01:72- 01:99, 01:101-01:104, 01:106-01:143, 01:145-01:175, 01:177-01:189, 01:191- 01:193, 01:195-01:203, 01:205-01:249, 01:251-01:288, 01:290N-01:297, 01:299- 01:301Q, 01:303:01-01:325, 01:327-01:333, 01:335-01:419, 02:346, 02:427, 02:644, 02:749, 02:952, 03:41, 23:122^w, 24:44^w, 24:109^w, 24:260^w, 25:01:01:01-25:01:21, 25:03-25:12N, 25:14, 25:16, 25:18-25:63, 25:65-25:70, 25:72-25:74, 25:76-25:80, 26:01:01:01-26:01:21, 26:01:23-26:01:27, 26:01:29-26:12:01:02, 26:14-26:18, 26:20:01-26:29, 26:31-26:32, 26:34- 26:43:02, 26:45-26:63, 26:66-26:82, 26:84- 26:131, 26:133-26:147, 26:149-26:150, 26:152-26:193, 26:196-26:223, 31:03, 31:164, 32:62, 33:13, 33:184, 36:01:01:01- 36:12, 43:01-43:03, 66:05, 66:15, 74:10, 74:30, 80:01:01:01-80:09N</p>
<p>22</p>	<p>150 bp 230 bp</p>	<p>1070 bp</p>	<p>*11:37 *11:06, 11:18, 11:312</p>	<p>B*27:87 *02:05:01:01-02:06:04, 02:06:06-02:06:21, 02:06:23-02:06:30, 02:08:01-02:08:02, 02:10, 02:14, 02:21, 02:28, 02:41, 02:44, 02:51, 02:54, 02:57, 02:61, 02:72, 02:79:01- 02:79:02, 02:84, 02:91, 02:99:01, 02:106, 02:108, 02:122, 02:126-02:127, 02:137, 02:142-02:144, 02:154, 02:169-02:170, 02:172, 02:178-02:180, 02:229, 02:232, 02:244, 02:248, 02:259, 02:271, 02:278, 02:286, 02:290, 02:295, 02:300, 02:310, 02:324, 02:328, 02:330, 02:333, 02:337, 02:344, 02:355, 02:358-02:359, 02:373N, 02:376, 02:382, 02:387, 02:398, 02:404- 02:405, 02:409, 02:413, 02:415, 02:419:01- 02:421, 02:428, 02:433, 02:438, 02:453- 02:454, 02:465, 02:470-02:476N, 02:484, 02:489, 02:493, 02:495-02:496, 02:506N- 02:507, 02:527, 02:532, 02:546, 02:550, 02:558, 02:572, 02:577, 02:591:01-02:593, 02:602, 02:623, 02:625-02:626, 02:630- 02:631, 02:646, 02:655, 02:670, 02:672Q, 02:676, 02:697-02:698, 02:718, 02:723, 02:725, 02:727, 02:731, 02:737, 02:759- 02:760N, 02:766-02:768, 02:778, 02:790- 02:791N, 02:800-02:801, 02:805Q, 02:807N, 02:813-02:814, 02:817-02:818, 02:837, 02:843, 02:851, 02:863, 02:877-02:878, 02:886, 02:888, 02:898, 02:921:01-02:922, 02:933, 02:936N, 02:951, 02:954-02:955, 02:961, 02:963, 02:990, 02:994, 02:999N,</p>



0197

101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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 “Instructions for Use” (IFU)

Lot No.: **3R4**

Lot-specific information

				02:1002-02:1003, 02:1019-02:1020, 02:1025, 02:1039, 02:1048, 02:1050, 02:1058-02:1059N, 26:03:01:01- 26:03:01:02, 26:06, 26:21, 26:30, 26:78, 26:92, 26:111, 26:193, 68:15
23^{4,5}	80 bp	800 bp	*11:08, 11:25:01	*01:196, 02:03:01:01 ^w -02:03:11 ^w , 02:26, 02:99:01, 02:117 ^w , 02:148 ^w , 02:171:02, 02:253 ^w , 02:258 ^w , 02:264:01:01 ^w - 02:264:01:02 ^w , 02:281 ^w , 02:315 ^w , 02:345 ^w , 02:355 ^w , 02:370 ^w , 02:393, 02:412 ^w , 02:431 ^w , 02:447 ^w , 02:463 ^w , 02:466 ^w , 02:480 ^w , 02:489 ^w , 02:505 ^w , 02:529 ^w , 02:541 ^w , 02:544 ^w , 02:557 ^w , 02:568 ^w , 02:589, 02:592, 02:612 ^w , 02:619:02, 02:782, 02:809 ^w , 02:833N ^w , 02:849 ^w -02:850 ^w , 02:854 ^w , 02:860 ^w , 02:914 ^w , 02:949 ^w , 02:971 ^w , 02:976 ^w -02:977 ^w , 02:979 ^w , 02:988 ^w , 02:997Q ^w , 02:1000 ^w , 02:1002 ^w , 03:01:38, 03:123:02, 03:428, 68:42 ^w , 68:54 ^w , 68:61 ^w , 68:63, 68:183 ^w , 68:286 ^w
24⁶	295 bp 465 bp	1070 bp	*11:48 *11:21N	*01:41 *01:04:01:01N-01:04:01:02N, 03:21N, 23:07N, 24:11N, 30:132N
25⁶	190 bp 225 bp	1070 bp	*11:135 *11:24:01, 11:25:02, 11:47, 11:219, 11:221	*03:210, 68:160 *01:304, 03:01:02, 03:05:02, 03:396, 30:02:05, 34:02:02, 68:43:01, 80:01:01:01- 80:09N
26	305 bp	1070 bp	*11:26, 11:118, 11:372	*01:03:01:01-01:03:03, 01:192, 01:287N, 01:307, 01:315, 01:350, 01:355N, 26:32, 26:70, 26:176, 29:66, 31:164, 32:62, 33:13, 33:184, 36:03, 68:227, 74:10, 74:30, B*57:102, C*06:72
	370 bp		*11:41	*01:223, 26:125, 34:12, 66:30, C*04:210, C*04:237, C*06:90, C*07:277, C*07:394, C*07:695:01:01-07:695:01:02
27	160 bp 205 bp	1070 bp	*11:208:01N *11:17, 11:155, 11:226, 11:271, 11:326	*26:71N, 68:94N *01:01:01:01-01:01:11, 01:01:13-01:01:15, 01:01:17-01:01:54, 01:01:56-01:01:57, 01:01:59-01:01:109, 01:01:111-01:01:131, 01:01:133-01:02:02, 01:04:01:01N- 01:04:01:02N, 01:07-01:09:02, 01:11N, 01:13-01:18N, 01:22N-01:25, 01:27N-01:33, 01:35-01:40, 01:42-01:62, 01:64-01:65, 01:67:01-01:72, 01:74-01:88:03, 01:90- 01:118, 01:120-01:125, 01:127-01:129, 01:131-01:135, 01:137-01:159Q, 01:161- 01:191, 01:193-01:195, 01:197-01:199, 01:201-01:243, 01:245-01:254, 01:256- 01:286, 01:288-01:300, 01:302-01:306, 01:308N-01:314, 01:316-01:339, 01:341- 01:343, 01:345-01:349, 01:351-01:354, 01:356-01:359, 01:361N-01:379N, 01:382- 01:412, 01:414-01:419, 03:18, 03:187,



0197

101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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Lot No.: **3R4**

Lot-specific information

	260 bp		*11:27, 11:38-11:39, 11:55, 11:94, 11:209, 11:271, 11:326	25:59, 26:62, 26:72, 36:01:01:01-36:02, 36:04-36:12 *01:01:01:01-01:01:57, 01:01:59-01:01:65, 01:01:67-01:02:02, 01:04:01:01N- 01:04:01:02N, 01:06-01:19, 01:21-01:33, 01:35-01:40, 01:42-01:62, 01:64-01:65, 01:67:01-01:71, 01:74-01:88:03, 01:90- 01:101, 01:103-01:129, 01:131-01:166, 01:168-01:191, 01:193-01:199, 01:201- 01:243, 01:245-01:254, 01:256-01:266:02, 01:268-01:283, 01:285N-01:286, 01:288- 01:300, 01:302-01:306, 01:308N-01:314, 01:316-01:339, 01:341-01:349, 01:351- 01:354, 01:356-01:379N, 01:381-01:389, 01:391-01:417N, 01:419, 03:18, 03:97, 03:122, 03:135, 03:167, 24:92, 24:458, 24:551, 24:557, 25:59, 30:75, 80:01:01:01- 80:09N
28	140 bp 240 bp 280 bp	800 bp	*11:80 *11:15:02, 11:49, 11:170Q *11:385	*03:289:01, 30:39:02, C*06:219, C*07:541, C*07:816 *26:35
29⁴	80 bp	1070 bp	*11:10	*02:55, 02:741, 02:815, 03:24, 24:290, 26:03:01:01-26:03:01:02, 26:06, 26:21, 26:30, 26:78, 26:111, 26:177, 30:163, 33:01:01:01-33:01:16, 33:03:01:01-33:07, 33:10-33:12, 33:14-33:16, 33:18:01-33:20, 33:22-33:37, 33:39-33:47, 33:49-33:52, 33:54-33:65, 33:67-33:134, 33:136-33:146, 33:148-33:187, 33:189-33:214, 33:216- 33:230N, 34:01:01:01-34:18, 34:20-34:22, 34:25-34:30N, 66:01:01:01-66:01:06, 66:02:01:01-66:10, 66:12-66:22, 66:24- 66:41, 66:43-66:46, 68:01:01:01-68:01:26, 68:01:28-68:01:62, 68:02:01:01-68:02:21, 68:02:23-68:09, 68:11N-68:12:02, 68:15- 68:29, 68:31-68:35:01:02, 68:37-68:45, 68:47-68:65, 68:67-68:74, 68:76:01-68:83, 68:85-68:108, 68:110-68:112:01, 68:113:01- 68:129, 68:131-68:135, 68:137-68:152, 68:154-68:177, 68:179-68:198, 68:200- 68:226, 68:228-68:248, 68:250-68:256, 68:258-68:278, 68:280-68:283, 68:285- 68:294, 69:01:01:01-69:09
30	140 bp 190 bp 235 bp 270 bp	1070 bp	*11:80 *11:131, 11:156 *11:45, 11:50Q, 11:182Q *11:29, 11:55, 11:215N	*66:11 *66:27N, B*07:111N
31^{4,8}	85 bp 230 bp 285 bp	1070 bp	*11:256Q *11:49 *11:30, 11:43	C*06:219, C*07:541, C*07:816 *01:101, 01:143, 03:87, 26:177, 26:207, 29:66, 30:92, 31:03, 31:164, 33:13, 33:184, C*07:449



0197

101.416-12/04 – including *Taq* polymerase
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Lot No.: **3R4**

Lot-specific information

32	205 bp	1070 bp	*11:31, 11:35, 11:158, 11:183	*01:21, 01:126, 01:200, 01:244, 02:156, 02:338, 02:952, 03:07:01:01-03:07:01:02, 03:42, 03:133, 03:171, 03:332, 03:373, 03:442, 30:04:01:01-30:04:04, 30:06, 30:09:01:01-30:09:01:02, 30:17, 30:29, 30:46, 30:77, 30:90, 30:103, 30:105, 30:117, 30:139, 30:150, 30:155, 30:183, 31:03- 31:04:02, 31:176, 31:179, 33:49, 33:144, 68:103:01-68:103:02, 74:23
	295 bp		*11:32:01-11:32:02, 11:50Q, 11:147	*01:115, 03:154:01-03:154:02, 30:51, 30:106
33 ⁴	110 bp	1070 bp	*11:61	C*07:221
	280 bp		*11:74	
	305 bp		*11:56	
34 ⁴	85 bp	1070 bp	*11:58	*26:119
	150 bp		*11:208:01N, 11:251N	*26:71N, 68:94N
	190 bp		*11:67, 11:156	B*27:237
	265 bp		*11:46	*68:242, B*37:64
35 ⁴	95 bp	1070 bp	*11:62, 11:178, 11:190	*01:95, 01:125, 01:289, 03:219, 23:09, 23:28, 24:77, 24:191, 31:07, 31:10, 32:03:01:01-32:03:01:02, B*15:95
	290 bp		*11:68	*01:322
	450 bp		*11:62	*01:125
36 ^{4,5}	65 bp	1070 bp	*11:65:01-11:65:02	*03:174, B*44:36
	220 bp		*11:193, 11:210N	*01:306, 24:264, 24:441
	380 bp		*11:64	*03:438, 31:65, 36:11, 68:165
37 ⁴	105 bp	1070 bp	*11:66	*02:156, 02:338, 02:952, 02:961, 03:171, 03:271, 03:373, 03:428, 03:442, 68:103:01- 68:103:02
	185 bp		*11:57, 11:158, 11:359	
	265 bp		*11:51	
38 ⁴	290 bp	1070 bp	*11:72	*01:352, 03:287
	95 bp		*11:105, 11:189	*02:484, 26:77, 66:13, B*39:110
	130 bp		*11:75, 11:251N	*25:73, B*07:117, B*18:215, B*38:100
	225 bp		*11:78N	
39	205 bp	1070 bp	*11:166	*01:203, 80:01:01:01-80:09N, C*04:129, C*05:25, C*05:42, C*06:05, C*06:67, C*07:101, C*07:148, C*07:161, C*07:583, C*08:28, C*08:137, C*08:168
	255 bp		*11:235Q	
40	280 bp	1070 bp	*11:52Q, 11:74	*01:13, 01:176, 01:194, 03:01:01:01- 03:01:07, 03:01:09-03:01:11, 03:01:13- 03:01:22, 03:01:24-03:01:82, 03:01:84- 03:01:93, 03:01:95-03:07:02, 03:10-03:11N, 03:13-03:31, 03:33-03:35, 03:37-03:40, 03:42-03:56:01:02, 03:58, 03:60-03:71, 03:73-03:87, 03:90-03:106, 03:110, 03:112- 03:141, 03:143-03:148, 03:150-03:151, 03:153-03:171, 03:174-03:175, 03:177, 03:181-03:193, 03:195, 03:197:01N- 03:197:02N, 03:201-03:202, 03:204, 03:206- 03:210, 03:212-03:215, 03:217-03:218, 03:220, 03:222-03:242, 03:244,
	225 bp		*11:199:01-11:199:02, 11:222	



0197

101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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Lot No.: **3R4**

Lot-specific information

				03:246-03:251, 03:253-03:259, 03:261-03:266N, 03:268-03:272, 03:274-03:299, 03:301-03:318, 03:320-03:329N, 03:331-03:381N, 03:383-03:395, 03:397, 03:399-03:412, 03:414-03:428, 03:430-03:448N, 30:55, 30:186, 34:08, 68:71, 69:07, 74:13
41⁴	90 bp 215 bp	1070 bp	*11:59 *11:01:57, 11:31, 11:35, 11:60, 11:158, 11:183, 11:209, 11:366	*01:376, 03:191, 03:236 *01:12, 01:19, 01:21, 01:126, 01:200, 01:244, 01:360, 02:156, 02:338, 02:952, 03:02:01:01-03:02:06, 03:07:01:01- 03:07:02, 03:10, 03:31-03:32, 03:42, 03:73, 03:76, 03:82, 03:90, 03:106, 03:113, 03:133, 03:160, 03:171, 03:198, 03:218, 03:223, 03:236-03:237, 03:242, 03:244, 03:253, 03:274-03:275N, 03:281, 03:285, 03:309, 03:314, 03:318-03:319, 03:332-03:333, 03:348, 03:356, 03:373, 03:385, 03:442, 24:92, 24:458, 24:551, 24:557, 30:04:01:01 ^w -30:04:04 ^w , 30:06 ^w , 30:09:01:01-30:09:01:02, 30:17 ^w , 30:29 ^w , 30:46 ^w , 30:77 ^w , 30:90 ^w , 30:99 ^w , 30:103 ^w , 30:105 ^w , 30:117 ^w , 30:139 ^w , 30:150 ^w , 30:155 ^w , 30:183, 31:03-31:04:02, 31:176, 31:179, 33:49, 33:144, 68:103:01 ^w - 68:103:02 ^w , 74:23
42⁴	95 bp 175 bp 235 bp 560 bp	1070 bp	*11:134, 11:189 *11:63 *11:287N *11:69N	*02:484, 26:77, 68:147 *68:269N *01:56N, 02:989N
43^{7,8}	265 bp 305 bp 445 bp	1070 bp	*11:51 *11:272Q *11:70:01-11:70:02, 11:121	*01:83:01-01:83:02, 01:405, 02:65, 02:80, 02:114, 02:117, 02:152, 02:246, 02:279, 02:298, 02:304, 02:406, 02:527, 02:582, 02:662, 02:872, 02:927, 02:985, 03:23:01- 03:23:02, 03:89:01-03:89:02, 03:198, 29:48, 31:109, 32:93, 33:08-33:09, 68:30, 68:75:01-68:75:02, 74:04, 74:21, B*15:462, B*57:04:01-57:04:03, B*57:32, B*58:114
44	145 bp 215 bp	800 bp	*11:76 *11:106	*02:1026, 03:354
45	210 bp 235 bp 340 bp 400 bp	1070 bp	*11:79 *11:219 *11:129, 11:163 *11:210N	*03:396, 68:43:01
46	280 bp	1070 bp	*11:172-11:173	*01:37:01:01-01:37:01:02, 01:404, 03:316, 03:360, 30:156, 30:170
47⁴	55 bp	1070 bp	*11:44, 11:269	*24:285
48	195 bp	800 bp	*11:71, 11:135	*03:210, 68:160



0197

101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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Lot No.: **3R4**

Lot-specific information

49	180 bp	800 bp	*11:16, 11:35, 11:57, 11:73, 11:109N, 11:158	*02:156, 02:338, 02:952, 02:961, 03:123:01- 03:123:02, 03:171, 03:428, 03:442, 68:103:01-68:103:02
	230 bp		*11:23, 11:50Q, 11:182Q, 11:346	*03:229
50 ⁷	210 bp	800 bp	*11:142	*03:304, 30:181
	310 bp 400 bp		*11:86 *11:210N	*01:246, 03:218
51 ⁵	170 bp	1070 bp	*11:77, 11:126:01:01- 11:126:01:02, 11:348	*03:26, 03:318
	285 bp		*11:172	*01:37:01:01-01:37:01:02, 03:360, 30:156, 30:170
52 ⁴	90 bp	1070 bp	*11:34	*01:205, 26:75
	230 bp 545 bp		*11:81 *11:108	*01:45, 02:453, 02:557, 02:690, 03:78, 23:92, 23:96, 24:271, 30:201, 33:151, 36:12, 66:17
53	160 bp 195 bp	1070 bp	*11:154 *11:100, 11:175	*24:575 *01:109, 03:182, 30:200
54	195 bp	1070 bp	*11:109N, 11:166, 11:238N	*01:203, 80:01:01:01-80:09N, C*04:129, C*05:25, C*05:42, C*06:05, C*06:67, C*07:101, C*07:148, C*07:161, C*07:583, C*08:28, C*08:137, C*08:168
	270 bp		*11:89, 11:153:01- 11:153:02, 11:351Q	*01:86, 03:04:01-03:04:03, 03:345:01:01- 03:345:01:02, 30:34
55 ^{4,6}	115 bp	800 bp	*11:102, 11:128	*01:148, 01:177, 03:327, 03:368, 23:88, 24:249, 24:544, 30:114, 30:189
	170 bp 235 bp		*11:194 *11:90	*03:208, 80:01:01:01-80:02, 80:04-80:09N
56 ⁴	65 bp	1070 bp	*11:94, 11:112, 11:211, 11:290	*01:10, 01:21, 01:26, 01:192, 02:848, 03:135, B*15:90^w, B*45:05^w
	185 bp 230 bp		*11:238N *11:99N	
57	245 bp	800 bp	*11:36	*29:142
58 ^{4,5}	100 bp	1070 bp	*11:105, 11:115N	*66:13, B*39:110
	140 bp 245 bp		*11:251N *11:180N	
59	165 bp	1070 bp	*11:174	
	340 bp 370 bp		*11:163 *11:124	*01:419
60 ^{4,7}	105 bp	800 bp	*11:128, 11:137:01N- 11:137:02N	*01:148, 01:268, 03:11N, 03:327, 30:189
	275 bp		*11:127N, 11:153:01- 11:153:02, 11:351Q	*01:86, 03:04:01-03:04:03, 03:345:01:01- 03:345:01:02, 30:34
61 ⁴	90 bp	1070 bp	*11:34	*01:205, 26:75
	130 bp		*11:03:01:01, 11:175, 11:348, 11:381	*02:393, 02:489, 02:541, 02:589, 02:592, 02:838, 03:135, 03:225, 03:280:01- 03:280:02, 24:177, 24:289, 26:28, 26:52, 29:83, 29:153, 31:97, 31:110, 32:145, 68:183, B*15:173, B*15:477, B*50:11, C*03:299, C*12:74, C*12:197
	265 bp		*11:54:01	*01:140:02, 02:784, 03:145:02, 24:561, 33:70



0197

101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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Lot No.: **3R4**

Lot-specific information

62	205 bp	1070 bp	*11:03:01:01, 11:08, 11:20, 11:25:01- 11:25:02, 11:175, 11:191, 11:348, 11:381	*03:01:01:01-03:01:05, 03:01:07-03:01:13, 03:01:15-03:01:46, 03:01:48, 03:01:50- 03:01:51, 03:01:53-03:01:114, 03:03N- 03:06, 03:08:01:01-03:09, 03:11N-03:17:02, 03:19-03:30, 03:33-03:41, 03:43-03:53, 03:55-03:63, 03:65-03:72, 03:74, 03:77- 03:81, 03:83-03:89:02, 03:91N-03:94, 03:96- 03:105, 03:107-03:112, 03:114-03:126, 03:128-03:132, 03:134, 03:136-03:139, 03:141-03:152, 03:154:01-03:159, 03:161N- 03:170, 03:172-03:176, 03:178N-03:186, 03:188-03:193, 03:195-03:197:02N, 03:199, 03:201-03:203, 03:205-03:214, 03:216- 03:217, 03:219-03:222, 03:224-03:228, 03:230, 03:232-03:233, 03:235, 03:238- 03:241, 03:243, 03:245-03:248, 03:250- 03:252, 03:254-03:259, 03:261-03:273, 03:276-03:280:02, 03:282-03:284N, 03:286N-03:287, 03:289:01-03:308, 03:310- 03:313, 03:315-03:317, 03:320-03:321, 03:323N-03:331, 03:334N-03:342N, 03:344- 03:346, 03:349-03:355, 03:357N-03:372, 03:374N-03:376, 03:378-03:384, 03:386- 03:413, 03:415, 03:417-03:441, 03:443- 03:448N, 25:43, 30:89, 30:160, 32:04, 34:02:01:01-34:04, 34:07-34:10N, 34:13, 34:15, 34:20-34:22, 34:24-34:26N, 34:28- 34:30N
63⁵	145 bp 170 bp 275 bp	1070 bp	*11:171 *11:154, 11:194 *11:120	*23:121 *24:575
64⁹	-	-	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*11 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



0197

For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

Date: December 2022, Rev. No: 00

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Lot-specific information

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 9, 16, 23, 36, 51, 58 and 63 may have tendencies of unspecific amplifications.

⁶Primer mixes 7, 14, 21, 24, 25 and 55 may give rise to a lower yield of HLA-specific PCR product than the other A*11 primer mixes.

⁷Primer mixes 9, 13, 16, 43, 50 and 60 may have a tendency of giving rise to primer oligomer formation.

⁸Primer mixes 31 and 43 may give rise to a long unspecific amplification product of about 800 bp. This band should be disregarded when interpreting the A*11 SSP typings.

⁹Primer mix 64 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: may be weakly amplified.



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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.	195	270	190	235	180	190	210	100	85	120	165	240
PCR product		305			210	550		175		280		
Length of int.	800	1070	1070	1070	800	1070	1070	800	800	1070	800	1070
pos. control ¹												
5'-primer(s) ²	127 5'-ggg 3'	28 5'-TCC 3'	363 5'-ATA 3'	363 5'-ATA 3'	363 5'-ATA 3'	292 5'-CTC 3'	363 5'-ATA 3'	484 5'-ACg 3'	527 5'-TgC 3'	97 5'-TCA 3'	413 5'-CCg 3'	357 5'-ATT 3'
					831 5'-gAg 3'	399 5'-TTA 3'		553 5'-TgC 3'		103 5'-CCA 3'		363 5'-ATA 3'
						413 5'-CCC 3'		565 5'-gCA 3'		261 5'-AAC 3'		
3'-primer(s) ³	282 5'-gAC 3'	127 5'-CTT 3'	502 5'-CTg 3'	559 5'-CgT 3'	502 5'-CTC 3'	559 5'-CCg 3'	521 5'-ggA 3'	616 5'-CgT 3'	570 5'-CCg 3'	341 5'-CgT 3'	539 5'-TCT 3'	559 5'-CCg 3'
	282 5'-gAC 3'	164 5'-gCg 3'	524 5'-CAC 3'	559 5'-CgT 3'	899 5'-ACg 3'		539 5'-TCC 3'					559 5'-CCg 3'
	282 5'-gAC 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.	195	100	100	95	205	225	100	180	100	150	80	295
PCR product			215	210		240	175	235		230		465
							265					
Length of int.	800	1070	800	1070	1070	1070	800	800	1070	1070	800	1070
pos. control ¹												
5'-primer(s) ²	102 5'-ACC 3'	282 5'-CAg 3'	282 5'-CAg 3'	385 5'-ggT 3'	363 5'-ATA 3'	97 5'-TCC 3'	103 5'-CCT 3'	103 5'-CCT 3'	282 5'-CAC 3'	103 5'-CCT 3'	489 5'-gCA 3'	341 5'-ggA 3'
		282 5'-CAg 3'	363 5'-ATA 3'	391 5'-ACA 3'		363 5'-ATA 3'						3 rd 5'-A 3'
				399 5'-TTA 3'								
				503 5'-CAg 3'								
3'-primer(s) ³	257 5'-gCA 3'	341 5'-CgT 3'	341 5'-Cgg 3'	559 5'-CCg 3'	526 5'-CCg 3'	282 5'-gAC 3'	164 5'-gCT 3'	236 5'-CCA 3'	341 5'-CgT 3'	214 5'-CCA 3'	527 5'-CCT 3'	353 5'-TgA 3'
			341 5'-CCg 3'		526 5'-CCA 3'	564 5'-ACC 3'	236 5'-CCA 3'	244 5'-CTT 3'		292 5'-gTg 3'	527 5'-CCT 3'	621 5'-ggg 3'
			538 5'-CAA 3'			565 5'-CAg 3'	327 5'-TTT 3'	299 5'-TCg 3'				
							329 5'-ggC 3'					
Well No.	13	14	15	16	17	18	19	20	21	22	23	24



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Lot-specific information

Well No.	25	26	27	28	29	30	31	32	33	34	35	36
Length of spec.	190	305	160	140	80	140	85	205	110	85	95	65
PCR product	225	370	205	240		190	230	295	280	150	290	220
			260	280		235	285		305	190	450	380
						270				265		
Length of int.	1070	1070	1070	800	1070	1070	1070	1070	1070	1070	1070	1070
pos. control ¹												
5'-primer(s) ²	87	341	103	103	261	103	97	363	77	103	257	322
	5'-ATA 3'	5'-ggA 3'	5'-CCT 3'	5'-CCA 3'	5'-AAC 3'	5'-CCT 3'	5'-TCA 3'	5'-ATA 3'	5'-CTA 3'	5'-CCT 3'	5'-CCA 3'	5'-gCC 3'
	97		363	151		363	151		101		363	395
	5'-TCC 3'		5'-ATA 3'	5'-gCC 3'		5'-ATA 3'	5'-gCC 3'		5'-CAT 3'		5'-ATA 3'	5'-gCT 3'
	134			363			363		272			644
	5'-CCA 3'			5'-ATA 3'			5'-ATA 3'		5'-TgC 3'			5'-CA 3'
	363											662
	5'-ATA 3'											5'-CCg 3'
3'-primer(s) ³	282	362	224	341	299	244	341	527	341	146	299	418
	5'-gAC 3'	5'-TCA 3'	5'-TCT 3'	5'-CgT 3'	5'-CCA 3'	5'-CTT 3'	5'-CgT 3'	5'-CCA 3'	5'-CgT 3'	5'-CCg 3'	5'-TCT 3'	5'-gTC 3'
	538	430	271	460		261	407	616		201	427	831
	5'-CAg 3'	5'-gCg 3'	5'-CAT 3'	5'-CAC 3'		5'-gTA 3'	5'-CC 3'	5'-CgC 3'		5'-CTC 3'	5'-gTg 3'	5'-TCC 3'
			330	564		299	605	616		224	614	
			5'-TgC 3'	5'-ACC 3'		5'-CCg 3'	5'-gCA 3'	5'-TgC 3'		5'-TCT 3'	5'-TgT 3'	
			521	565		327				242		
			5'-ggA 3'	5'-CAA 3'		5'-TTT 3'				5'-CCC 3'		
			570			330				261		
			5'-CCg 3'			5'-TgC 3'				5'-gTA 3'		
						460				329		
						5'-CAC 3'				5'-ggC 3'		
						559						
						5'-CTC 3'						
						587						
						5'-CCT 3'						
Well No.	25	26	27	28	29	30	31	32	33	34	35	36



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Lot-specific information

Well No.	37	38	39	40	41	42	43	44	45	46	47	48
Length of spec.	105	95	205	225	90	95	265	145	210	280	55	195
PCR product	185	130	255		215	175	305	215	235			
	265	225	280			235	445		340			
	290					560			400			
Length of int.	1070	1070	1070	1070	1070	1070	1070	800	1070	1070	1070	800
pos. control ¹												
5'-primer(s) ²	28	103	101	98	363	103	28	98	87	755	527	125
	5'-TCC 3'	5'-CCT 3'	5'-CAT 3'	5'-CTT 3'	5'-ATA 3'	5'-CCT 3'	5'-TCC 3'	5'-CTA 3'	5'-ATA 3'	5'-CAT 3'	5'-TgC 3'	5'-CgC 3'
	363	107				3 rd I	257	511	112	763		134
	5'-ATA 3'	5'-gT 3'				5'-ATA 3'	5'-Cgg 3'	5'-AgA 3'	5'-CCT 3'	5'-TCA 3'		5'-CCA 3'
			127						644			
			5'-gg 3'						5'-CA 3'			
			176						701			
			5'-gCA 3'						5'-CCT 3'			
									703			
									5'-CTA 3'			
3'-primer(s) ³	122	154	341	282	412	154	122	270	282	899	539	282
	5'-Cgg 3'	5'-CAT 3'	5'-CgT 3'	5'-gAC 3'	5'-CCC 3'	5'-CAT 3'	5'-Cgg 3'	5'-ACT 3'	5'-gAC 3'	5'-ACA 3'	5'-TCC 3'	5'-gAC 3'
	427	164			527	164		616	899			
	5'-gTA 3'	5'-gCA 3'			5'-CCA 3'	5'-gCT 3'	5'-gCg 3'	5'-CgT 3'	5'-ACA 3'			
	506	181			546	235	418					
	5'-TgT 3'	5'-gTT 3'			5'-TAA 3'	5'-CTg 3'	5'-gTC 3'					
	613	201				295						
	5'-gCA 3'	5'-CTC 3'				5'-TCA 3'						
		285				723						
		5'-T.. 3'				5'-TgT 3'						
Well No.	37	38	39	40	41	42	43	44	45	46	47	48
Well No.	49	50	51	52	53	54	55	56	57	58	59	60
Length of spec.	180	210	170	90	160	195	115	65	245	100	165	105
PCR product	230	310	285	230	195	270	170	185		140	340	275
		400		545			235	230		245	370	
Length of int.	800	800	1070	1070	1070	1070	800	1070	800	1070	1070	800
pos. control ¹												
5'-primer(s) ²	363	644	755	428	650	116	363	154	368	103	670	363
	5'-ATA 3'	5'-CA 3'	5'-CAT 3'	5'-CgC 3'	5'-CCC 3'	5'-gCT 3'	5'-ATA 3'	5'-A.g 3'	5'-gTg 3'	5'-CCT 3'	5'-CCg 3'	5'-ATA 3'
		733	874	565		176	650	199			703	
		5'-ATA 3'	5'-CCg 3'	5'-gCA 3'		5'-gCA 3'	5'-CCC 3'	5'-gCT 3'			5'-CTA 3'	
		832		3 rd I		199		521			877	
		5'-AgA 3'		5'-ATA 3'		5'-gCT 3'		5'-ggC 3'			5'-Agg 3'	
						363						
						5'-ATA 3'						
3'-primer(s) ³	497	899	899	616	770	341	430	341	570	153	899	426
	5'-Tgg 3'	5'-ACA 3'	5'-ACA 3'	5'-CgT 3'	5'-TgA 3'	5'-CgT 3'	5'-gCT 3'	5'-CgT 3'	5'-CAC 3'	5'-ACT 3'	5'-ACA 3'	5'-TCC 3'
	513			704	806	513	559	545		164		426
	5'-TCT 3'			5'-CCA 3'	5'-CCA 3'	5'-TCT 3'	5'-CTC 3'	5'-AgA 3'		5'-gCA 3'		5'-TCT 3'
	542					595	727			201		430
	5'-CTg 3'					5'-CCT 3'	5'-CCA 3'			5'-CTC 3'		5'-gCT 3'
	559					595	779			305		585
	5'-CTC 3'					5'-CCg 3'	5'-CTC 3'			5'-CA 3'		5'-AgT 3'
												595
												5'-CCg 3'
												595
												5'-CCT 3'
Well No.	49	50	51	52	53	54	55	56	57	58	59	60



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Lot-specific information

Well No.	61	62	63
Length of spec.	90	205	145
PCR product	130		170
	265		275
Length of int. pos. control ¹	1070	1070	1070
5'-primer(s) ²	391	363	650
	5'-ACA 3'	5'-ATA 3'	5'-CCC 3'
	527		
	5'-TgA 3'		
	565		
	5'-gCA 3'		
3'-primer(s) ³	616	527	755
	5'-CgT 3'	5'-CCT 3'	5'-CCC 3'
			770
			5'-TgA 3'
			779
			5'-CTC 3'
			884
			5'-ggC 3'
Well No.	61	62	63

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.: **3R4**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-A*11 SSP subtyping kit ²																				
				Well																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
				Prod. No.:	201673201	201898402	201673203	201673204	201673205	201673206	201673207	201673208	201673209	201673210	201898411	201673212	201673213	201673214	202025615	201673216
IHC 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	+	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-



0197

101.416-12/04 – including Taq polymerase
 101.416-12u/04u – without Taq polymerase

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Lot No.: **3R4**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-A*11 SSP subtyping kit ²																				
				Well																
				17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
				Prod. No.:	201673217	201673218	201673219	201673220	201673221	201673222	201673223	201673224	201673225	201673226	201673227	201673228	201673229	201673230	201898431	201673232
	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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Lot No.: **3R4**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-A*11 SSP subtyping kit ²																				
				Well																
				33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
				Prod. No.:	201673233	201898434	201673235	201673236	201673237	201898438	201673239	201673240	201673241	201898442	201898443	201673244	201673245	201898446	201673247	201898448
IHC 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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Lot No.: **3R4**

Lot-specific information

CELL LINE VALIDATION SHEET																					
HLA-A*11 SSP subtyping kit ²																					
					Prod. No.:	Well											62	63			
						49	50	51	52	53	54	55	56	57	58	59			60	61	
	IHWC cell line ¹	A*				201673249	201673250	201898451	201673252	201898453	201673254	202244655	201673256	201673257	201898458	201673259	202244660	201898461	201673262	201673263	
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			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



101.416-12/04 – including *Taq* polymerase
 101.416-12u/04u – without *Taq* polymerase

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

Lot No.: **3R4**

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, 8, 9, 13, 19, 23, 28, 30, 31, 33 to 38, 42 to 45, 47 to 50, 52, 53, 56 to 61 and 63 were available.

The specificities of the primers in primer solutions 5, 9, 13, 23, 28, 31, 35, 37, 43 to 45, 47, 48, 52, 53, 56, 59 and 61 were tested by separately adding one or two additional 5'-primers, respectively one or two additional 3'-primers.

In primer solutions 19, 30, 34, 38, 42, 49, 58, 60 and 63 it was only possible to test the 5'-primers, the 3'-primers were not possible to be tested.

In primer solutions 8, 33, 36, 50 and 57 it was only possible to test the 3'-primers, the 5'-primers were not possible to be tested.

In primer solutions 6, 10, 12, 14, 16, 25, 28, 31, 39, 44 to 46, 48, 52, 54, 56, 59 and 61 one to four of the 5'-primers were not possible to be tested.

In primer solutions 1, 2, 5, 15, 18, 20, 22, 24, 26 to 28, 31, 32, 35, 37, 41, 43, 44 and 52 to 55 one to four of the 3'-primers were not possible to be tested.

In addition, one or more primers in primer solutions 3, 10, 18, 24, 25, 27, 40, 51, 54, 55 and 62 were tested by separately adding one additional 5'-primer and/or one or two additional 3'-primers respectively.



0197

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Lot-specific information

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0197

For *In Vitro* Diagnostic Use

MA123 v02 SSP PI Template

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