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**Manual No.: 20**  
**Revision: May 4, 2011**  
**Product No.: 120**  
**Lot No.: A13-3 B12-1 C10-1**


**CTS** Collaborative Transplant Study

**WORKING INSTRUCTION**

**HLA-A\*/-B\*/-C\***  
**CTS-PCR-SSP TRAY KITS**

**LOCUS- AND LOT-SPECIFIC MANUAL**

To be applied to the following product:

Product No.	Description
120	HLA-A*/-B*/-C* CTS-PCR-SSP TRAY KIT 

**HLA-A TYPING**

**Main differences between lot A13-3 (the current lot) and lot A13-2:**

- An update with the IMGT/HLA Sequence Database of April 2011 was performed; therefore, the mix specificities have been extended by new alleles.
- The size of the PCR product of mix 17 has been altered (see Table 1).

**HLA-B TYPING**

**Main differences between Lot B12-1 (the current lot) and Lot B12-0:**

- An update with the IMGT/HLA Sequence Database of April 2011 was performed; therefore, the mix specificities have been extended by new alleles.

**HLA-C TYPING**

**Main differences between lot C10-1 (the current lot) and lot C10-0**

- An update with the IMGT/HLA Sequence Database of April 2011 was performed; therefore, the mix specificities have been extended by new alleles.

## Introduction

- Intended use: This kit reveals a low/intermediate resolution typing of HLA-A, HLA-B and HLA-C by the PCR-SSP method.
- Allele coverage:  
IMGT/HLA Sequence Database Release 3.4.0, April 2011 for HLA-A, HLA-B and HLA-C, except for:  
**HLA-A\*** HLA-A\*01:01:08, 01:01:11, 01:01:15, 01:69, 01:72, 01:85, 03:18, 03:23:01-03:23:02, 03:42, 03:85, 11:23-11:24:02, 11:31, 11:35, 11:40, 11:45, 11:50Q, 11:78N, 11:94, 11:98, 24:129, 26:60N, 29:29, 31:01:07:31:21-31:22, 32:01:07, 32:28, 33:01:05, 33:03:07, 33:19, 33:30, 33:32, 33:35, 68:48-68:50, 68:59N, 74:10 and 80:02;  
**HLA-B\*** B\*07:94/07:119/07:122, B\*08:12:03/08:26/08:45/08:48/08:50/08:58/08:63, B\*13:22:01-13:22:02, B\*14:02:03/14:02:06/14:08/14:10/14:21, B\*15:162-15:163/15:168, B\*27:75, B\*35:102, B\*38:17, B\*39:01:11/39:24:02/39:30/39:34/39:36/39:47/39:50, B\*44:02:13/44:83/44:111, B\*51:45/51:81, B\*53:17:01, B\*54:09, B\*55:27/55:39/55:42/55:44 and B\*58:27;  
**HLA-C\*** C\*01:02:10/01:50/01:55, C\*03:58/03:86/03:94/03:99, C\*04:01:23/04:73/04:83, C\*07:22/07:95/07:136-07:140/07:165/07:176, C\*08:27/08:33/08:35/08:39, C\*15:06:02/15:37/15:41/15:43-15:44, C\*16:22/16:24/16:35 and C\*17:07.  
The alleles mentioned above are considered to be rare and can be detected e. g. by sequencing using the CTS-SEQUENCE Kits (please contact us for further information).
- This manual is only valid for Lot No. **A13-3 B12-1 C10-1**.
- This manual should be used together with the Main Manual (General Information) 'Working Instruction for the CTS-PCR-SSP **TRAY and MINITRAY KITS**' (Manual No. 100A).

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## **1. Kit Composition**

- Number of PCR primer mixes per test: 96, of which:
  - 24 allele-specific mixes for HLA-A typing
  - 48 allele-specific mixes for HLA-B typing
  - 23 allele-specific mixes for HLA-C typing
  - 1 negative control mix
- Number of tests per tray: 1
- Number of trays per kit: 10
- The primer mixes are aliquoted and lyophilized in thin-walled, green PCR-trays.
- PCR buffer: 3 ml of 7.5% Mastermix (without Taq polymerase).

For storage condition, please refer to Section 1 of the ‘Working instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS’ (Manual No. 100A) supplied along with this product.

## **2. Materials, Reagents and Equipment not supplied**

Please refer to Section 2 of the ‘Working instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS’ (Manual No. 100A) supplied along with this product.

## **3. Sample Requirements, PCR and Gel Electrophoresis**

Please refer to Section 3 to 6 of the ‘Working instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS’ (Manual No. 100A) supplied along with this product.

## **4. Result Evaluation**

- 4.1 Check the approximate base pair size of the PCR product against the Primer Mix Specificity Table(s) (Appendix / Table 1, 2 and 3) to confirm the correct product size.
- 4.2 Use the Typing Table(s) (Appendix / Table 4, 5 and 6) to make the allele assignments or use the SCORE Software ([www.IHWG.org](http://www.IHWG.org)) for detailed result interpretation.

## **5. Interpretation Hints**

The quality and quantity of DNA as well as of the Taq polymerase are extremely crucial factors. If your bands are too weak, you might try to adjust these two factors until you obtain optimal results.

Please also refer to Section 7 of the ‘Working instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS’ (Manual No. 100A) supplied along with this product

## SPECIAL NOTES

### HLA-A Locus:

- The following mixes will give **short** PCR products (< 200 bp): **mixes 5, 20, 23 and 24**. These PCR products might be difficult to be distinguished from the 89 bp amplification control (internal positive control) PCR product. In general, the allele-specific product will give a much stronger signal than that of the amplification control and will not migrate as far into the gel as the amplification control band. If you are not sure whether the (strong) signal represents an allele-specific product or just the amplification control, you might let the gel run for an additional 15 minutes at a lower voltage. By this way, the allele-specific band can be separated from the amplification control band and you will be able to clearly see a double signal at this position: a strong allele-specific band and - compared to that - a weaker shorter amplification control band. Since mix 5 corresponds to A\*23 and mix 23 to A\*02 (both alleles/groups are common), it is recommended to always start the interpretation by checking these reactions very carefully first!
- Some mixes contain specific primers which may give rise to **PCR fragments of two or more different sizes** simultaneously (see Table 1).

### HLA-B Locus:

- The following mixes will give **short** allele-specific PCR products (<200 bp): **mixes 5, 9, 20, 43, and 47**. These PCR products might be difficult to be distinguished from the 89 bp amplification control (internal positive control) PCR product. In general, the allele-specific product will give a much stronger signal than that of the amplification control and will not migrate as far into the gel as the amplification control band. If you are not sure whether the (strong) signal represents an allele-specific product or just the amplification control, you might let the gel run for an additional 15 minutes at a lower voltage. By this way, the allele-specific band can be separated from the amplification control band and you will be able to clearly see a double signal at this position: a strong allele-specific band and - compared to that - a weaker shorter amplification control band. Since three of these mixes correspond to quite frequent alleles (B\*18 and B\*35 = mix 5; B\*27 = mix 9; B\*15(62) = mix 43), it is recommended to start your evaluation by checking these four reactions very carefully first!
- Some HLA-B\* mixes will amplify **two or even three fragments of different sizes** (e. g. mixes 9, 10, 15, 19, 25 and 35). Mixes with 2 fragments of almost the same size are not mentioned here.
- **Mix 7**  
Some HLA-A specificities will cause a positive reaction with this mix
- **Mix 9**
  - The most common B\*27 alleles (B\* 27:02, \*27:04 and \*27:05) will generate two fragments: a **short** fragment (155 bp) + a **long** fragment (525 bp).
  - Amplification of B\*27:06 will result **only** in a **short** fragment (155 bp).
  - B\*47:01:01:01-47:08 will **only** give rise to a **long** fragment (525bp).
- **Special notes to HLA-B\*07**  
The common HLA-B\*07 alleles react positively with mix 1 and mix 28. Some HLA-B\*07 alleles may cause additional weakly positive reactions with mix 24, especially if high amounts of Taq polymerase or high DNA-concentrations are used.

- **Special notes to HLA-B\*13**

**B\*13:01** reacts positively with **mix 3**, whereas **B\*13:02** is amplified by **mix 3 and mix 34**.  
The rare alleles **B\*13:03 and B\*13:04** can only be detected by **mix 34**.

**Mix 34** gives **different PCR products for B\*13:**

- Amplification of **B\*13:04** results in **two fragments** (430 bp and 490 bp).
- Amplification of **B\*13:02:01/03/08Q/09/14-16/18/19** shows only **the smaller fragment** (430 bp).
- Amplification of **B\*13:10** shows only **the larger fragment** (490 bp).

## **HLA-C Locus:**

- **Exclusion/detection of C\*04:09N:**

- If **only mix 6** is positive, the DNA is probably C\*04 positive (e. g. C\*04:01), but negative for C\*04:09N.

- In contrast, if **mix 6 and 7** are both positive, the DNA is typed **positive** for **HLA-C\*04:09N**.

Attention: The fragment size of **mix 7** is **small (138 bp)**!

- The most common HLA-C\*07 alleles will be detected by **two** PCR-SSP mixes, mix 11 and mix 12. HLA-C\*07:04/07:11/07:12/07:45/07:68 are amplified by mix 11 with usual intensity and weakly by mix 12.
- PCR-SSP mix no. 2, 5, 6, 12, 13, 16 and 20 will also detect some HLA-**B** specificities (most of them are considered to be rare). Please take this into consideration when interpreting your results.

## **6. Troubleshooting**

Please refer to Section 8 of the ‘Working instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS’ (Manual No. 100A) supplied along with this product.

## **7. Precaution**

Please refer to Material Safety Data Sheet for the CTS-PCR-SSP TRAY and MINITRAY KITS (Manual No. 100B) supplied along with this product.

## **8. Contact**

If you have any particular questions concerning this kit, which are not answered in this or the Main Manual, please do not hesitate to contact me or my coworkers at:

Tel.: ++49 6221 564013

Fax: ++49 6221 564200

E-mail: [hien.tran@med.uni-heidelberg.de](mailto:hien.tran@med.uni-heidelberg.de)

Hien Tran, M.D.

**Table 1:** Sizes of the PCR products and allele specificities for each HLA-A\* CTS-PCR-SSP primer mix (Lot-No A13-3) based on IMGT/HLA Sequence Database Release 3.4.0, April 2011

**Amplification control (internal positive control): 89 base pairs (bp)**

Position on Tray				Primer mix	Allele specificity	Serology	Product size (bp)
H1	H4	H7	H10	MIX 1	A*01:01:01:01-01:01:07/01:01:09-01:01:10/01:01:12-01:01:14/01:01:16-01:04N/01:06-01:33/01:35-01:68/01:70-01:71/01:73-01:84/01:86-01:93	A1, Null, -, Undefined	650 bp
G1	G4	G7	G10	MIX 2	A*03:107, A*11:17, A*32:24, A*36:01-36:05	-, Undefined, A36	580 bp
F1	F4	F7	F10	Mix 3	A*02:01:01:01-02:01:15/02:01:18-02:01:19/02:01:21-02:01:25/02:01:27-02:01:51/02:01:53-02:05:02/02:05:04-02:22:02/02:24:01-02:35:01/02:35:03-02:47/02:49/02:51/02:53N-02:54/02:56:01/02:57-02:59/02:61-02:63/02:66-02:79:02/02:81-02:87/02:89-02:97:02/02:99/02:101:01-02:102/02:104-02:113N/02:115-02:116/02:118/02:120-02:121/02:123-02:128/02:130-02:134/02:136-02:151/02:153-02:168/02:170-02:176/02:179-02:184/02:186-02:187/02:189-02:192/02:194/02:196-02:222N/02:224-02:228/02:230-02:245/02:247-02:253/02:255-02:272/02:274/02:276-02:278/02:280-02:285/02:287/02:289-02:297/02:299-02:300/02:302-02:303/02:305N-02:307	A2, Low A2, -, A203/A2, A210/A2, Null, A2/blank, Undefined	455 bp
E1	E4	E7	E10	MIX 4	<b>A*03:01:01:01-03:09/03:11N-03:17/03:19-03:22/03:25-03:29/03:31-03:41/03:43-03:84/03:85w/03:86-03:88/03:90-03:122, A*11:25, A*32:04, A*36:02</b>	A3, Null, -, A3/blank, A11, A32/A3, A36	see below
					A*03:01:01:01-03:01:01:03/03:01:03-03:01:13/03:01:15-03:01:28/03:03N-03:06/03:08-03:09/03:11N-03:17/03:19-03:22/03:25-03:29/03:33-03:41/03:43-03:48/03:51-03:53/03:55-03:63/03:67-03:68N/03:70-03:72/03:74-03:75/03:77-03:81/03:83-03:84/03:85w/03:86-03:88/03:91N-03:105/03:107-03:112/03:114-03:122, A*11:25, A*32:04	A3, Null, -, A3/blank, A11, A32/A3	550 bp
					A*03:01:01:01-03:04:02/03:07-03:09/03:11N-03:17/03:19-03:22/03:25-03:29/03:31-03:39/03:41/03:43-03:84/03:85w/03:86-03:88/03:90-03:96/03:99-03:104/03:106-03:121, A*32:04, A*36:02	A3, Null, -, A32/A3, A36	580 bp
D1	D4	D7	D10	Mix 5	A*23:01:01-23:23/23:25-23:33/23:35-23:37/23:39-23:40, A*24:24/24:71, A*29:07, A*31:29, B*18:27	A23, -, Null, A9, A24, A29	195 bp
C1	C4	C7	C10	Mix 6	<b>A*02:46/02:48/02:70/02:129, A*03:30, A*23:01:01-23:02/23:04-23:08N/23:10-23:21/23:24-23:27/23:29-23:36/23:39-23:40, A*24:02:01:01-24:02:16/24:02:18-24:02:38/24:02:40-24:02:44/24:02:46/24:03:01-24:07/24:09N-24:11N/24:13:01-24:15/24:17-24:20/24:22-24:23/24:25-24:28/24:30/24:32-24:41/24:43-24:64/24:66/24:68-24:88/24:90N-24:121/24:123-24:128/24:130-24:155N/24:157/24:159-24:177, A*31:08, A*33:21</b>	A2, -, A3, A23, Null, A24, Low A24, A2403/A24, A9, A24/A3, A31/A24	see below
					A*03:30, A*23:31, A*24:17/24:41/24:62/24:106, A*31:08, A*33:21	A3, -, A24,	435 bp

						A31/A24	
					A*02:46/02:48/02:70/02:129, A*23:01:01-23:02/23:04-23:08N/23:10-23:21/23:24-23:27/23:29-23:36/23:39-23:40, A*24:02:01:01-24:02:16/24:02:18-24:02:38/24:02:40-24:02:44/24:02:46/24:03:01-24:07/24:09N-24:11N/24:13:01-24:15/24:17-24:20/24:22-24:23/24:25-24:28/24:30/24:32-24:41/24:43-24:64/24:66/24:68-24:88/24:90N-24:121/24:123-24:128/24:130-24:155N/24:157/24:159-24:177	A2, -, A23, Null, A24, Low A24, A2403/A24, A9, A24/A3	470 bp
B1	B4	B7	B10	MIX 7	A*24:02:01:01-24:02:44/24:02:46-24:03:02/24:05/24:07-24:11N/24:14-24:15/24:17/24:20-24:21:02/24:23/24:25-24:27/24:29-24:43/24:45N-24:64/24:66-24:86N/24:88/24:90N-24:93/24:95-24:106/24:108/24:110-24:124/24:126-24:128/24:130-24:132N/24:134-24:137/24:139-24:142/24:144-24:159/24:161-24:166/24:168-24:169/24:171-24:177, A*25:04, A*32:02, B*51:55	A24, Low A24, -, A2403/A24, A9, Null, A24/A9, A25, A32	510 bp
A1	A4	A7	A10	Mix 8	<b>A*02:52/02:135/02:309, A*25:01:01/25:01:02w/25:01:03-25:10/25:11w/25:12N-25:16, A*30:01:01-30:04:01/30:06-30:20/30:22-30:25/30:27N-30:52</b>	A2, -, A25, Null, A30	see below
					A*02:52, A*30:01:01-30:04:01/30:06-30:20/30:22-30:25/30:27N-30:52	A2, A30, -, Null	550 bp
					A*02:135/02:309	-	560 bp
					A*25:01:01/25:01:02w/25:01:03-25:10/25:11w/25:12N-25:16	A25, -, Null	405 bp
H2	H5	H8	H11	Mix 9	<b>A*02:135, A*25:01:01-25:13/25:15-25:16, A*26:01:01-26:18/26:20-26:30/26:32-26:43:02/26:45-26:59/26:61-26:68, A*34:01:01-34:09, A*66:01-66:16</b>	-, A25, Null, A26, A10, A34, A66	
					A*02:135, A*26:07:01-26:07:02	-, A26	450 bp
					A*25:01:01-25:13/25:15-25:16, A*26:01:01-26:06/26:08-26:18/26:20-26:30/26:32-26:43:02/26:45-26:59/26:61-26:68, A*34:01:01-34:09, A*66:01-66:16	A25, -, Null, A26, A10, A34, A66	445 bp
G2	G5	G8	G11	Mix10	<b>A*02:135/02:309, A*25:11, A*26:01:01/26:01:03-26:01:12/26:01:14-26:32/26:34-26:43:02/26:45-26:59/26:61-26:68, A*43:01</b>	-, A26, A10, Null, Undefined, A43	
					A*02:135/02:309, A*25:11, A*26:03:01-26:03:02/26:06/26:21/26:30/26:36	-, A26	415 bp
					A*26:01:01/26:01:03-26:01:12/26:01:14-26:02/26:04-26:05/26:07:01-26:20/26:22-26:29/26:31-26:32/26:34-26:35/26:37-26:43:02/26:45-26:59/26:61-26:68, A*43:01	A26, -, A10, Null, Undefined, A43	405 bp
F2	F5	F8	F11	MIX 11	<b>A*02:17:01-02:17:02/02:108/02:110/02:300/02:303, A*23:04, A*24:03:01-24:03:02/24:10/24:18/24:22/24:33/24:94/24:125/24:138/24:167, A*26:48, A*29:07, A*31:29, A*34:01:01-34:01:02/34:05, B*18:27w</b>	A2, -, A23, A2403/A24, A24/A3, A29, A34	see below
					A*26:48, A*34:01:01-34:01:02/34:05	-, A34	580 bp
					A*02:17:01-02:17:02/02:108/02:110/02:300/02:303, A*23:04, A*24:03:01-24:03:02/24:10/24:18/24:22/24:33/24:94/24:125/24:138/24:167, A*29:07, A*31:29, B*18:27w	A2, -, A23, A2403/A24, A24/A3, A29	245 bp

E2	E5	E8	E11	MIX 12	A*25:02, A*26:13/26:19/26:33, A*32:17, A*34:01:01-34:01:02/34:05-34:06, A*66:01-66:02/66:04/66:06-66:14/66:16, A*74:13	A25, A26, Undefined, -, A34, A10, A66	415 bp
D2	D5	D8	D11	MIX 13	A*01:51, A*03:24, A*11:10, A*34:02:01-34:04/34:07-34:09	-, A3, A11, A34	385 bp
C2	C5	C8	C11	MIX 14	<b>A*02:12-02:13/02:19/02:27/02:37-02:38/02:44/02:49/02:54/02:142, A*03:02w/03:10/03:31w, A*11:01:01-11:16/11:18-11:22/11:23w/11:26-11:27/11:29-11:30/11:32-11:34/11:36-11:39/11:41-11:44/11:46-11:49/11:51-11:77/11:79-11:93/11:95-11:97/11:99N/11:101-11:103, A*24:19/24:28/24:44/24:89, A*31:24w, A*33:19w, A*68:09/68:26/68:28</b>	A2, A2/blank, -, A3, A3/blank, A11, Undefined, Null, A9, A68	see below
					A*02:49, A*11:08/11:44, A*68:28	A2, A11, -, A68	520 bp
					A*02:12-02:13/02:19/02:27/02:37-02:38/02:44/02:54/02:142, A*03:02w/03:10/03:31w, A*11:01:01-11:07/11:09-11:16/11:18-11:22/11:23w/11:26-11:27/11:29-11:30/11:32-11:34/11:36-11:39/11:41-11:43/11:46-11:49/11:51-11:77/11:79-11:93/11:95-11:97/11:99N/11:101-11:103, A*24:19/24:28/24:44/24:89, A*31:24w, A*33:19w, A*68:09/68:26	A2, A2/blank, -, A3, A3/blank, A11, Undefined, Null, A9, A68	520 bp
B2	B5	B8	B11	MIX 15	A*29:01:01:01-29:27, A*32:30/32:32	A29, Null, -, Undefined	515 bp
A2	A5	A8	A11	MIX 16	<b>A*30:01:01-30:04:02/30:06-30:11:02/30:13-30:17/30:19-30:20/30:22-30:40/30:42-30:52</b>	A30, -, Null	see below
					A*30:01:01-30:04:02/30:06-30:11:02/30:13-30:17/30:19-30:20/30:22-30:25/30:27N-30:40/30:42-30:52	A30, -, Null	570 bp
					A*30:01:01-30:01:04/30:08/30:11:01-30:11:02/30:14L-30:16/30:19-30:20/30:24/30:26/30:30-30:31/30:35-30:40/30:42-30:44/30:48-30:49/30:52	A30, -	680 bp
H3	H6	H9	H12	MIX 17	A*29:14, A*31:01:02-31:01:06/31:01:08-31:07/31:09-31:20/31:23-31:50	Undefined, A31, -, Null	185 bp
G3	G6	G9	G12	MIX 18	<b>A*23:03:01, A*24:18, A*29:13, A*31:07-31:08/31:10, A*32:01:01-32:01:06/32:01:08-32:27N/32:29-32:33/32:35</b>	A23, A24/A3, Undefined, A31/A24, A32, -, A32/A3, Null	see below
					A*23:03:01, A*29:13, A*31:07-31:08/31:10, A*32:01:01-32:01:06/32:01:08-32:03/32:05-32:27N/32:29-32:33/32:35	A23, Undefined, A31/A24, A32, -, Null	410 bp
					A*24:18, A*32:04	A24/A3, A32/A3	520 bp
F3	F6	F9	F12	MIX 19	<b>A*02:65/02:152, A*32:15, A*33:01:01-33:01:04/33:01:06/33:03:01-33:03:06/33:03:08-33:18/33:20/33:22-33:29/33:31/33:33-33:34/33:36-33:44, A*74:04, B*08:01:07</b>	A2/A19, -, A32, A33, Undefined, A74, B8	
					A*02:65/02:152, A*33:08-33:09, A*74:04	A2/A19, -, Undefined, A74	475 bp
					A*32:15, A*33:01:01-33:01:04/33:01:06/33:03:01-33:03:06/33:03:08-33:07/33:10-33:18/33:20/33:22-33:29/33:31/33:33-33:34/33:36-33:44,	A32, A33, -, Undefined, B8	470 bp

					B*08:01:07		
E3	E6	E9	E12	MIX 20	<b>A*29:19, A*74:01-74:09/74:11-74:15</b>	-, A74, Null	
					A*29:19, A*74:01-74:09/74:11-74:15	-, A74, Null	160 bp
					A*29:19, A*74:01-74:02:01:02/74:04-74:09/74:11-74:13/74:15	-, A74, Null	160 bp
D3	D6	D9	D12	MIX 21	<b>A*02:01:09/02:05:05/02:06:07/02:11:02/02:35:03/02:50/02:122, A*24:94/24:138, A*25:05, A*68:01:01:01-68:47/68:51-68:58/68:60-68:78, A*69:01</b>	A2, -, A25, A68, Null, A28, A69	
					A*02:01:09/02:05:05/02:06:07/02:11:02/02:35:03/02:50/02:122, A*24:94/24:138, A*25:05, A*68:01:01:01-68:47/68:51-68:58/68:60-68:78, A*69:01	A2, -, A25, A68, Null, A28, A69	645 bp
					A*02:01:09/02:05:05/02:06:07/02:11:02/02:35:03/02:50/02:122, A*24:94/24:138, A*25:05, A*68:01:01:01-68:31/68:33-68:47/68:51-68:58/68:60-68:78, A*69:01	A2, -, A25, A68, Null, A28, A69	645 bp
C3	C6	C9	C12	MIX 22	A*02:34-02:35:03/02:56:01-02:56:02/02:62/02:78/02:103, A*69:01	A2, Undefined, A69	390 bp
B3	B6	B9	B12	MIX 23	<b>A*02:01:01:01-02:01:08/02:01:10-02:01:11/02:01:12w/02:01:13-02:01:15/02:01:17-02:01:19/02:01:21-02:01:32/02:01:34-02:01:39/02:01:41-02:01:56/02:01:58-02:05:03/02:06:01-02:06:06/02:06:08-02:11:01/02:11:03-02:22:02/02:24:01-02:35:01/02:35:02w/02:36-02:77/02:79:01-02:97:02/02:99/02:101:01-02:121/02:123-02:140/02:142-02:277/02:279-02:309/02:311, A*03:89, A*24:02:06, A*30:07w/30:13w/30:16w/30:22w</b>	A2, Low A2, -, A203/A2, A210/A2, Null, A2/blank, A2/A28, A2/A19, A24, A30	see below
					A*02:50	A2	205 bp
					A*02:50	A2	225 bp
					A*02:01:01:01-02:01:08/02:01:10-02:01:11/02:01:12w/02:01:13-02:01:15/02:01:18-02:01:19/02:01:21-02:01:32/02:01:34-02:01:39/02:01:41-02:01:50/02:01:53-02:01:56/02:01:58-02:05:02/02:06:01-02:06:06/02:06:08-02:11:01/02:11:03/02:12-02:22:01/02:24:01-02:35:01/02:36-02:44/02:47/02:49/02:51-02:54/02:57-02:60/02:62-02:77/02:79:01-02:91/02:93-02:97:02/02:99/02:101:01-02:102/02:104-02:112/02:114-02:121/02:123-02:128/02:130-02:140/02:142/02:145-02:168/02:170-02:175/02:177-02:184/02:186-02:194/02:196-02:200/02:202-02:204/02:207-02:216/02:218-02:248/02:250N-02:277/02:279-02:309/02:311, A*03:89, A*30:22w	A2, Low A2, -, A203/A2, A210/A2, Null, A2/blank, A2/A19, A30	135 bp

					A*02:01:01:01-02:01:08/02:01:10-02:01:11/02:01:12w/02:01:13-02:01:15/02:01:17-02:01:19/02:01:21-02:01:30/02:01:32/02:01:34-02:01:39/02:01:41-02:01:56/02:01:58-02:05:03/02:06:01-02:06:06/02:06:08-02:07/02:09-02:11:01/02:11:03-02:19/02:21-02:22:02/02:24:01-02:33/02:35:02w/02:36-02:49/02:51-02:54/02:57-02:61/02:63-02:77/02:79:01-02:97/02:99/02:101:01-02:102/02:104-02:121/02:123-02:127/02:129-02:138/02:140/02:142-02:157/02:159-02:168/02:170-02:194/02:196-02:207/02:210-02:249/02:251-02:257/02:259-02:271/02:273-02:277/02:279-02:291/02:293Q-02:309/02:311, A*03:89, A*24:02:06, A*30:07w/30:22w	A2, Low A2, -, A203/A2, A210/A2, Null, A2/blank, A2/A19, A24, A30	165 bp
					A*02:01:01:01-02:01:02/02:01:04-02:01:08/02:01:10-02:01:11/02:01:12w/02:01:13-02:01:15/02:01:17-02:01:19/02:01:21-02:01:32/02:01:34-02:01:39/02:01:41-02:01:48/02:01:50-02:01:56/02:01:58-02:05:03/02:06:01/02:06:03-02:06:06/02:06:08-02:10/02:12-02:22:02/02:24:01-02:34/02:36-02:47/02:49/02:51-02:68/02:70-02:77/02:79:01-02:80/02:82N-02:86/02:88N-02:89/02:91-02:97/02:99/02:101:01-02:111/02:113N-02:115/02:117-02:121/02:123/02:125N-02:127/02:130-02:135/02:137-02:140/02:142-02:145/02:147-02:183/02:185-02:246/02:248-02:260/02:262-02:277/02:279-02:296/02:299-02:307/02:309/02:311, A*03:89, A*30:13w/30:16w	A2, Low A2, -, A203/A2, A210/A2, Null, A2/blank, A2/A28, A2/A19, A30	190 bp
A3	A6	A9	A12	MIX 24	<b>A*43:01, A*80:01</b>	A43, A80	see below
					A*80:01	A80	170 bp
					A*43:01	A43	445 bp

w = weak

? = nucleotide sequence information not available for the primer matching sequence

**bold:** mixes which result in PCR fragments of different sizes (the specificities are first indicated all in one row, then split into groups in the following rows depending on the fragment size)

**Table 2:** Sizes of the PCR products and allele specificities of each HLA-B\* CTS- PCR-SSP primer mix (**Lot-No B12-1**) based on IMGT/HLA Sequence Database Release 3.4.0, April 2011

**Amplification control (internal positive control): 89 base pairs (bp)**

Position on Tray	Mix	Specificities	Serology	Product Size
H4	Mix 1	*07:02:01-07:05:05/07:06-07:18:02/07:20-07:32/07:34-07:39/07:41-07:52/07:55-07:59/07:61-07:93/07:95-07:99/07:101-07:118/07:120-07:121/07:124-07:130, 35:66, 40:25/40:106, 42:05:01/42:05:02w, 46:06, 48:06, 81:01-81:05, C*02:23, C*04:77, C*07:38	B7, -, B703/B7, B7/blank, Undefined, B7/B42, Null, B35, B40, B81, Cw7	see below
		*07:02:01-07:05:05/07:06-07:12/07:14-07:18:02/07:20-07:32/07:34-07:39/07:41-07:52/07:55-07:59/07:61-07:93/07:95-07:99/07:101-07:118/07:120-07:121/07:124-07:130, 35:66, 40:25/40:106, 42:05:01/42:05:02w, 48:06, 81:01-81:05	B7, -, B703/B7, B7/blank, Undefined, B7/B42, Null, B35, B40, B81	630 bp
		*07:13, 46:06, C*02:23, C*04:77, C*07:38	B7/blank, Undefined, -, Cw7	615 bp
G4	Mix 2	*07:29, 08:01:01-08:05/08:07-08:12:02/08:13-08:25/08:27-08:44/08:46-08:47/08:51-08:57/08:59-08:61/08:64-08:70, 15:142/15:180, 39:12, 44:49, 51:68, C*02:14, C*07:01:07/07:04:03/07:14/07:27:02, C*12:16	B7, B8, -, B8/blank, Null, Undefined, B39, B44, Cw2, Cw7	see below
		*08:09, 51:68	B8, -	545 bp
		*07:29, 08:01:01-08:05/08:07-08:08N/08:10-08:12:02/08:13-08:25/08:27-08:44/08:46-08:47/08:51-08:57/08:59-08:61/08:64-08:70, 15:142/15:180, 39:12, 44:49, C*02:14, C*07:01:07/07:04:03/07:14/07:27:02, C*12:16	B7, B8, -, B8/blank, Null, Undefined, B39, B44, Cw2, Cw7	560 bp
F4	Mix 3	*13:01:01-13:02:10/13:06-13:21/13:23/13:25-13:36/13:38-13:39/13:41-13:44	B13, -, Null, Undefined	585 bp
E4	Mix 4	*18:01:01-18:01:08/18:01:10-18:01:11/18:01:13-18:07:01/18:08-18:15/18:17N-18:25/18:27-18:28/18:30-18:36/18:38-18:40/18:42-18:44/18:46-18:47/18:49-18:54/18:56-18:60/18:62-18:63, 35:20:02	B18, -, B18/blank, Null, Undefined, B35	465 bp
D4	Mix 5	*07:65, 08:32, 15:202, 18:01:01-18:08/18:10-18:15/18:17N-18:36/18:38-18:47/18:50-18:53/18:55-18:61/18:63, 35:01:01-01-35:01:19/35:01:21-35:03:02/35:03:04-35:08:01/35:08:03-35:18/35:20:01-35:24:02/35:28-35:45/35:48/35:50-35:55/35:57-35:62/35:64-35:72/35:74-35:99/35:101:01-35:101:02/35:104-35:153/35:155-35:163, 37:11/37:14, 39:19:01-39:19:02, 56:06, 78:01-78:05/78:07	-, B8, B18, B18/blank, Null, Undefined, B35, B35/B78, B35/22, B39	135 bp
C4	Mix 6	*35:01:01:01/35:01:02-35:01:07/35:02:01-35:03:01/35:04:01-35:04:02/35:05:01/35:06-35:08:03/35:09:01-35:09:02/35:11:01/35:14:01-35:15/35:17-35:19/35:21/35:23-35:24:01/35:25/35:27/35:29-35:30/35:32-35:38/35:40N-35:42:01/35:45-35:50/35:52-35:58/35:62/35:64-35:66/35:68:01-35:68:02/35:70-35:71/35:74-35:75/35:77-35:78/35:81/35:84/35:89-35:94/35:129N/35:146/35:154/35:157/35:162, 53:01:01-53:01:04/53:02-53:06/53:08:01/53:10-53:16/53:19	B35, B35/blank, B35/B78, Null, -, B53, B53/B35, B53/B51	400 bp

Position on Tray	Mix	Specificities	Serology	Product Size
B4	Mix 7	*07:12/07:14w/07:18:01/07:18:02w, 08:49, 13:36, 15:02:01-15:02:04/15:13/15:21/15:44/15:80w/15:88-15:89/15:112w/15:121/15:139/15:144/15:170/15:194/15:213-15:214/15:223, 35:01:01:01-35:01:03/35:01:04w/35:01:05-35:04:03/35:06-35:08:02/35:08:03w/35:08:04-35:09:02/35:11:01-35:11:02/35:12:01w/35:12:02/35:14:01-35:15/35:18-35:21/35:23-35:24:01/35:25-35:27/35:29/35:33-35:36/35:38/35:39w/35:40N-35:42:02/35:45-35:50/35:52-35:57/35:59w/35:61w/35:62/35:64-35:65Q/35:70-35:71/35:74/35:76-35:78/35:81-35:85/35:88/35:90-35:96/35:100-35:101:02/35:103-35:110/35:112/35:115-35:116/35:119/35:121-35:124/35:126-35:134N/35:136-35:148/35:150/35:152-35:163, 37:08, 39:42w, 40:68, 42:13, 44:06w/44:12w, 51:04/51:42w/51:46w/51:56:01w/51:56:02, 53:01:01-53:13/53:15-53:16/53:18-53:24, 56:09/56:11/56:12w, 83:01w, A*25:01:01-25:01:02/25:02-25:08, A*26:01:01-26:01:07/26:02-26:03:01/26:04-26:06/26:08-26:18/26:20-26:21/26:23-26:30/26:33-26:37, A*34:01:01-34:01:02/34:05-34:06, A*66:01-66:08, A*68:02:01:01-68:02:02/68:15/68:18N/68:23/68:27-68:28/68:31/68:34/68:40/68:44, C*15:27	B7, -, B75, B77, B70, B35, B35/blank, B35/B78, Null, B35/22, B37, B39, Undefined, B44, B51, B53, B53/B35, B53/B51, B56, B22, A25, A26, A10, A34, A66, A68	380 bp
A4	Mix 8	*15:13, 27:30w, 44:06w/44:25w/44:50w, 51:04/51:42w/51:46w/51:56:01w/51:56:02, 53:01:01-53:02/53:04-53:06/53:08:01-53:08:02/53:10/53:15-53:16/53:17:02-53:24, 57:05, 58:01:01-58:01:09/58:04-58:05/58:09-58:13/58:17N/58:19/58:21-58:24/58:28-58:34	B77, B27, B44, B51, Undefined, -, B53, B53/B51, B57, B58, B17, Null	330 bp
H5	Mix 9	<b>*27:01-27:21/27:23-27:74/27:76-27:80, 40:124:01-40:124:02, 44:97, 47:01:01:01-47:08</b>	B27, -, B2708/B27/B7, Undefined, Null, B47, B17	<b>see below</b>
		*27:02-27:05:10/27:05:12-27:11/27:13-27:15/27:17/27:19-27:21/27:24-27:25/27:27-27:28/27:30/27:32-27:38/27:40-27:43/27:45-27:58/27:60-27:74/27:76/27:78-27:80, 44:97	B27, -, B2708/B27/B7, Undefined, Null	155 bp
		*27:01-27:05:16/27:08-27:10/27:12-27:19/27:23/27:25-27:26/27:28-27:32/27:36-27:40/27:42/27:44-27:45/27:47-27:74/27:77/27:79-27:80, 40:124:01-40:124:02, 47:01:01:01-47:08	B27, -, B2708/B27/B7, Undefined, Null, B47, B17	530 bp
G5	Mix 10	<b>*37:01:01-37:06/37:08-37:29</b>		<b>see below</b>
		*37:01:01-37:01:07/37:03N-37:06/37:08-37:29	B37, B37/B27, Null, -, Blank, Undefined	380bp
		*3702	-	500bp
F5	Mix 11	*13:46, 37:10, 38:01:01-38:16/38:18-38:30, 44:117, 51:13:01-51:13:02/51:92, 52:14, 53:04/53:07, 58:20/58:34, 59:03, A*24:96	-, B37, B38, B51, B53	395bp

Position on Tray	Mix	Specificities	Serology	Product Size
E5	Mix 12	*07:45w, 08:55, 15:48w/15:69/15:108w/15:136w/15:186, 35:35, 39:01:01:01-39:01:01:02L/39:01:03-39:01:10/39:01:12-39:20/39:22-39:24:01/39:25N-39:29/39:31/39:32w/39:35/39:37-39:42/39:44-39:46/39:48-39:49/39:51-39:63, 67:01:01-67:03	B7, -, B62, B72, B71, B35, B3901/B39, Low B39, B3902/B39, B16, Null, B67, Undefined	520 bp
D5	Mix 13	*38:26, 67:01:01-67:01:02/67:03	-, B67	545 bp
C5	Mix 14	*40:01:01-40:02:04/40:02:06-40:04/40:06:01:01-40:11:02/40:13-40:16/40:18-40:20/40:22N-40:25/40:27:01-40:27:02/40:29-40:38/40:40/40:42-40:45/40:47-40:50/40:52-40:62/40:64-40:70/40:72:01-40:91/40:94-40:100/40:102-40:131/40:134-40:136/40:138-40:155N/40:157-40:162/40:164, 44:16/44:21/44:31/44:64:01-44:64:02, 45:10, 47:01:01:01-47:07, 49:07	B60, -, B61, B61/blank, Undefined, Null, B40, B47/B44, B17	640 bp
B5	Mix 15	*07:27w/07:50w, 08:04w/08:17/08:54, 13:21, 15:07:01-15:07:02/15:33/15:45/15:55w/15:68/15:78:01-15:78:02/15:107/15:116/15:126/15:141/15:150/15:188/15:207, 18:14w/18:21w-18:22w, 35:72w, 37:07/37:09/37:12, 40:01:01-40:01:08/40:01:10-40:01:13/40:01:15-40:06:03/40:09-40:12/40:14:01-40:16/40:18-40:24/40:25w/40:27:01-40:27:02/40:29-40:40/40:42-40:60/40:62-40:67/40:69-40:74/40:76/40:78-40:86/40:88-40:94/40:96-40:105/40:107-40:114/40:116-40:120/40:122-40:135/40:137-40:141/40:143-40:145/40:147-40:157/40:159-40:161/40:163-40:164, 41:01-41:08/41:10-41:11/41:13/41:15/41:18, 42:11, 44:31/44:53-44:54/44:106/44:110, 48:01:01-48:01:03/48:03:01-48:05/48:07-48:24	Undefined, B8/blank, -, B62, B15, B18, B35, B37, B60, B61, B4005/B50, B60/B48, B40/B15, Null, B61/B41, B44	see below
		*07:27w/07:50w, 08:04w/08:17/08:54, 15:07:01-15:07:02/15:45/15:55w/15:68/15:126/15:207, 18:14w/18:22w, 35:72w, 37:07/37:09, 40:02:01-40:02:08/40:02:10-40:03/40:05/40:09/40:15-40:16/40:18-40:19/40:27:01-40:27:02/40:29/40:31-40:32/40:35/40:37/40:39-40:40/40:45/40:50/40:56-40:58/40:71/40:78/40:80/40:82/40:85/40:89-40:91/40:94/40:97-40:98/40:104-40:105/40:107/40:111/40:119/40:122/40:133Q/40:144N-40:145/40:157/40:164, 41:02:01-41:02:03/41:04/41:10-41:11/41:13/41:15/41:18, 42:11, 44:54/44:106/44:110, 48:01:01-48:01:03/48:04-48:05/48:07-48:16/48:18-48:20/48:22/48:24	Undefined, B8/blank, -, B62, B15, B18, B35, B37, B61, B4005/B50, B60, B61/B41, Null, B44, B48	375 bp
		*07:27w/07:50w, 08:04w/08:17, 13:21, 15:33/15:78:01-15:78:02/15:107/15:116/15:141/15:150/15:188, 18:21w, 37:07/37:09/37:12, 40:01:01-40:01:08/40:01:10-40:01:13/40:01:15-40:06:03/40:09-40:12/40:14:01-40:16/40:18-40:24/40:25w/40:27:01-40:27:02/40:29-40:34/40:36-40:40/40:42-40:60/40:62-40:67/40:69-40:70/40:72:01-40:74/40:76/40:78-40:81/40:83-40:86/40:88-40:94/40:96-40:105/40:107-40:114/40:116-40:120/40:122-40:135/40:137-40:141/40:143-40:145/40:147-40:157/40:159-40:161/40:163-40:164, 41:01-41:02:01/41:03:01-41:08, 44:31/44:53, 48:01:01-48:01:03/48:03:01-48:05/48:07-48:11/48:13/48:15-48:24	Undefined, B8/blank, -, B62, B37, B60, B61, B4005/B50, B60/B48, B40/B15, Null, B61/B41, B44	475 bp

Position on Tray	Mix	Specificities	Serology	Product Size
A5	Mix 16	*27:24/27:36, 40:01:01-40:01:06/40:01:08-40:01:18/40:07/40:22N-40:23/40:25/40:30-40:31/40:33-40:34/40:36/40:38/40:42-40:43/40:45-40:48/40:51-40:52/40:54-40:55/40:59-40:63/40:65-40:67/40:69/40:73-40:74/40:76/40:79-40:81/40:84/40:87:01-40:88/40:92/40:100-40:102/40:106/40:108/40:112-40:113/40:116-40:118N/40:123-40:126/40:128/40:130/40:132/40:134-40:135/40:139-40:141/40:146-40:147/40:149-40:156/40:160/40:163, 48:22	B27, B60, -, Null, B40, Undefined	690 bp
H6	Mix 17	*15:46/15:53/15:106/15:143/15:212, 18:48, 35:19/35:47/35:63/35:154, 37:06, 40:02:01-40:02:04/40:02:06-40:06:03/40:08-40:09/40:11:01-40:11:02/40:13-40:16/40:18-40:20/40:24/40:26-40:29/40:32/40:35/40:37/40:39-40:40/40:44/40:50/40:53/40:56-40:58/40:64/40:68/40:70-40:72:02/40:75/40:77-40:78/40:82-40:83/40:86/40:89-40:91/40:94-40:99/40:103-40:105/40:107/40:109-40:111/40:115/40:119-40:122/40:127/40:129/40:131/40:133Q/40:136/40:142N-40:145/40:148/40:157-40:159/40:161-40:162/40:164, 41:01-41:18, 44:02:01:01-44:02:12/44:02:14-44:05:02/44:07/44:09-44:30/44:32-44:39/44:41:01-44:43:02/44:45-44:51/44:53-44:56N/44:58N-44:59/44:61N-44:67/44:69-44:82/44:84-44:93/44:95-44:110/44:112-44:114/44:116-44:129, 45:01-45:13, 47:01:01:01-47:08, 49:01:01-49:01:02/49:02/49:04-49:11/49:13-49:16, 50:01:01-50:02/50:04/50:08-50:13	Undefined, -, B35/blank, B37, B61, B4005/B50, B61/blank, B60, B21, B61/B41, Null, B44, B45, B12, B47/B44, B17, B49	580 bp
G6	Mix 18	*27:18/27:29, 37:02, 40:124:01-40:124:02, 47:01:01:01-47:08	Undefined, B27, B37/B27, -, B47, B17	425 bp
F6	Mix 19	*07:12/07:14w/07:18:01/07:18:02w, 15:62/15:80w/15:124, 27:19w/27:24/27:30w/27:36, 35:25-35:26/35:49, 39:42w, 40:12/40:46, 42:13, 44:40w/44:44w, 48:01:01-48:04/48:06-48:07/48:09/48:11/48:15-48:25, 56:09/56:11/56:12w, 81:01-81:05, 83:01w	B7, Undefined, B70, B71, B27, B35, B39, B60/B48, -, B44, B48/B70, B56, B22, B81, Null	see below
		*07:12/07:14w/07:18:01/07:18:02w, 15:62/15:80w, 27:19w/27:30w, 35:25-35:26/35:49, 39:42w, 42:13, 44:40w/44:44w, 48:02:01-48:02:02/48:17/48:25, 56:09/56:11/56:12w, 83:01w	B7, Undefined, B70, B27, B35, B39, -, B44, B48/B70, B56, B22	435 bp
		*15:124, 27:24/27:36, 40:12/40:46, 48:01:01-48:01:03/48:03:01-48:04/48:06-48:07/48:09/48:11/48:15-48:24, 81:01-81:05	B71, B27, B60/B48, -, Undefined, B81, Null	580 bp
E6	Mix 20	*15:02:01-15:02:05/15:08/15:11:01-15:11:05/15:13/15:15/15:21/15:31/15:44/15:55/15:76/15:88-15:89/15:112/15:121/15:139/15:144/15:148/15:189/15:191/15:194/15:209N/15:213-15:215/15:223, 35:46, 51:104	B75, -, B75/B62, B77, B75/62, B15, Undefined, Null, B35	140bp

Position on Tray	Mix	Specificities	Serology	Product Size
D6	Mix 21	*07:09/07:11/07:17, 08:28/08:35/08:37, 15:03:01-15:03:03/15:18:01-15:18:02/15:18:04/15:23/15:29/15:47/15:49/15:51-15:52/15:54/15:61-15:62/15:64/15:68-15:69/15:72/15:74/15:80/15:91/15:93/15:98/15:103/15:108/15:114-15:115/15:119/15:123-15:124/15:127/15:131-15:132/15:134/15:151/15:153/15:156/15:158/15:161/15:173/15:176/15:180/15:186/15:197-15:198/15:200/15:210/15:221, 18:37, 27:41/27:78, 35:25-35:26/35:49, 39:07/39:43, 42:09, 48:02:01-48:02:02/48:14/48:23/48:25, 55:14/55:23/55:32, 56:03/56:09/56:18/56:31-56:32, C*07:46	B7, B8, -, B72, B71, B70/B5/blank, B70/blank, Undefined, B35, B16, B42, B48/B70, B55, B22/15, B56, Cw7	500 bp
C6	Mix 22	*08:62, 41:01-41:07/41:10-41:14/41:16-41:18, 42:02/42:09	-, B41, B42	790 bp
B6	Mix 23	<b>*07:04/07:19/07:25, 42:01:01-42:02/42:04-42:10/42:12-42:16, 45:06, 55:20, 56:13, 82:01-82:02, 83:01</b>	B7, B7/42, B42, Undefined, -, B45, B22, B56, B82	<b>see below</b>
		*07:04/07:19/07:25, 42:01:01-42:02/42:04-42:10/42:12-42:16, 45:06, 55:20, 56:13, 82:01-82:02, 83:01	B7, B7/42, B42, Undefined, -, B45, B22, B56, B82	550 bp
		*07:04/07:19/07:25, 42:01:01-42:02/42:04-42:06/42:08-42:10/42:12-42:16, 45:06, 55:20, 56:13, 82:01-82:02, 83:01	B7, B7/42, B42, -, B45, B22, B56, B82, Undefined	540 bp
A6	Mix 24	*07:02:01w-07:02:07w/07:03w-07:04w/07:07w-07:10w/07:12w/07:14w-07:16w/07:18:01w-07:31w/07:33w/07:35w-07:38w/07:41w-07:52w/07:54w-07:64w/07:66w-07:68:01w, 08:07w, 15:10:01w/15:37w/15:99w, 27:06w/27:21w/27:34w, 39:29w, 40:09w/40:18w/40:24w/40:31w-40:33w/40:42w/40:44w, 41:04w, 44:02:01:01-44:02:12/44:02:14-44:03:05/44:03:07-44:05:01/44:07/44:09/44:11-44:13/44:16/44:19N-44:30/44:32-44:42/44:44-44:56N/44:58N-44:59/44:61N/44:63-44:69/44:71-44:74/44:76/44:79-44:81/44:84-44:106/44:108N-44:110/44:112-44:116/44:118-44:122/44:124-44:130, 48:08w, 55:27w, 83:01w	B7, B703/B7, B7/42, B7/blank, Undefined, B7/B42, Null, -, B8, B71, B27, B39, B61, B60, B40, B41, B44, B45, B47/B44, B12, B55	490bp
H7	Mix 25	<b>*07:20, 15:14/15:91/15:131/15:161, 18:56, 35:45/35:71, 40:132, 44:02:10/44:06/44:09/44:34/44:46/44:90/44:129, 45:01-45:03/45:05-45:07/45:09/45:11-45:13, 46:17, 50:02, 51:23/51:42/51:108, 82:01-82:03, 83:01</b>	B7/blank, B76, Undefined, -, B35, B44, B45, B12, B51, B82	<b>see below</b>
		*44:02:10/44:06/44:34, 51:23/51:42/51:108	B44, B51, Undefined, -	715 bp
		*07:20, 15:14/15:91/15:131/15:161, 18:56, 35:45/35:71, 40:132, 44:09/44:46/44:90/44:129, 45:01-45:03/45:05-45:07/45:09/45:11-45:13, 46:17, 50:02, 82:01-82:03, 83:01	B7/blank, B76, Undefined, -, B35, B45, B12, B82	545 bp

Position on Tray	Mix	Specificities	Serology	Product Size
G7	Mix 26	*15:46/15:53/15:106/15:143, 40:05/40:15-40:16/40:23/40:26/40:28/40:32/40:51/40:95/40:148/40:158, 44:79, 49:01:01/49:01:03-49:02/49:04-49:10/49:12-49:17, 50:01:01-50:01:02/50:02/50:04/50:08-50:13	Undefined, -, B4005/B50, B61, B21, B49, B45	605 bp
F7	Mix 27	*07:78, 13:09, 15:18:03/15:42/15:73/15:86/15:224, 35:60, 39:17, 40:48/40:71, 45:01/45:03-45:08/45:10-45:13, 46:11/46:18, 50:01:01-50:02/50:04-50:08/50:10-50:13, 54:01:01-54:03/54:05N/54:07-54:08N/54:10/54:13/54:16-54:24, 55:01:01-55:03/55:05/55:07/55:09-55:12/55:15-55:16/55:18-55:19/55:21-55:22/55:24-55:26/55:29-55:31/55:33-55:38/55:40-55:41/55:43/55:45-55:48/55:50, 56:01:01-56:02/56:04/56:08/56:10/56:13-56:14/56:16-56:17/56:19N-56:20/56:23-56:30, 82:01-82:03, C*03:12/03:19, C*12:15, C*15:07	-, Undefined, B71, B15, B62, B35, B39, B60, B61, B45, B21, B22, B50, B54, Null, B55, B56, B82, Cw9, Cw3	395 bp
E7	Mix 28	*07:02:01-07:02:07/07:04-07:07/07:09w/07:10/07:11w/07:12/07:15/07:18:01-07:26/07:29-07:31/07:33-07:36/07:39-07:49N/07:51-07:68:01/07:78/07:80/07:90/07:97/07:105/07:112/07:123, 15:76w/15:101w, 35:76w, 42:01:01-42:02/42:04-42:06/42:08/42:09w/42:10/42:12-42:15, 45:06, 54:01:01-54:05N/54:06w-54:07w/54:08N/54:09w/54:10-54:13/54:14w/54:16-54:23, 55:01:01-55:05/55:07-55:17/55:19-55:22/55:23w/55:24-55:26/55:27w/55:28-55:31/55:32w/55:33-55:38/55:40-55:41/55:43/55:45-55:46/55:48-55:51, 56:01:01-56:02/56:03w/56:04-56:07/56:09w/56:10/56:11w/56:12-56:13/56:15-56:16/56:18w/56:19N-56:21/56:22w/56:24-56:30, 67:01:01-67:01:02, 81:01-81:04N, 82:01-82:03	B7, -, B7/42, B7/blank, B7/B42, Null, Undefined, B35/22, B45, B54, B22, B55, B56, B22/15, B78, B67, B81, B82	see below
		*07:02:01-07:02:07/07:04-07:07/07:09w/07:10/07:11w/07:12/07:15/07:18:01-07:26/07:29-07:31/07:33-07:36/07:39-07:49N/07:51-07:68:01/07:80/07:90/07:97/07:105/07:112/07:123, 15:76w/15:101w, 35:76w, 42:01:01-42:02/42:04-42:06/42:08/42:09w/42:10/42:12-42:15, 54:04/54:06w-54:07w/54:09w/54:11/54:14w, 55:01:04/55:04/55:08/55:13-55:14/55:17/55:20/55:23w/55:27w/55:28/55:32w/55:34/55:49/55:51, 56:03w/56:05:01-56:06/56:09w/56:11w/56:12/56:15/56:18w/56:21/56:22w, 67:01:01-67:01:02, 81:01-81:04N	B7, -, B7/42, B7/blank, B7/B42, Null, Undefined, B35/22, B54, B55, B56, B22, B22/15, B78, B67, B81	410 bp
		*07:78, 45:06, 54:01:01-54:03/54:05N/54:07w/54:08N/54:10/54:12-54:13/54:16-54:23, 55:01:01-55:03/55:05/55:07/55:09-55:12/55:15-55:16/55:19/55:21-55:22/55:24-55:26/55:29-55:31/55:33-55:38/55:40-55:41/55:43/55:45-55:46/55:48/55:50, 56:01:01-56:02/56:04/56:07/56:10/56:13/56:16/56:19N-56:20/56:24-56:30, 82:01-82:03	-, B45, B54, B22, Null, Undefined, B55, B56, B82	425 bp
D7	Mix 29	*54:01:01-54:05N/54:07-54:08N/54:10-54:24, 55:07	B54, -, B22, Null, Undefined	435 bp
C7	Mix 30	*07:20w/07:24/07:60/07:100, 15:76/15:101, 35:76, 45:06w, 54:03/54:06, 55:08/55:51, 56:01:01-56:07/56:09/56:11/56:13/56:15-56:16/56:20-56:22/56:24-56:30, 82:01w-82:02w, 83:01w	B7/blank, -, Undefined, B35/22, B45, B22, B56, B22/15, B78, Null, B82	560 bp

Position on Tray	Mix	Specificities	Serology	Product Size
B7	Mix 31	*44:18, 49:01:01-49:01:03/49:03/49:06-49:17, 51:15/51:62, 54:12, 59:01:01:01-59:01:01:02/59:04-59:05	B44, B49, -, Undefined, B59	395 bp
A7	Mix 32	*15:71/15:204/15:210, 18:15/18:19/18:21/18:30/18:57, 27:04:01-27:04:03/27:06/27:10/27:15/27:18/27:20-27:21/27:24-27:25/27:40/27:54/27:63/27:68-27:69/27:79, 37:07, 40:05/40:15-40:16/40:23/40:26/40:28/40:32/40:51/40:95/40:148/40:158, 46:14, 49:01:01/49:01:03-49:09/49:12-49:17, 50:01:01-50:01:02/50:02/50:04-50:09/50:11-50:12, 51:103	B62, -, B18, Undefined, B27, B4005/B50, B61, B21, B49, B45	715 bp
H8	Mix 33	*46:01:01-46:01:04/46:01:07-46:05/46:07N-46:22/46:24-46:27, 56:14, 67:02	B46, -, Null, B22, B56, Undefined	470 bp
G8	Mix 34	*13:02:01-13:04/13:08Q-13:10/13:14-13:16/13:18-13:19/13:26/13:30-13:34/13:37-13:38/13:40-13:42/13:44-13:46, 15:01:01:01-15:01:04/15:01:06-15:02:05/15:04-15:08/15:11:01-15:16:02/15:19-15:21/15:24-15:28/15:31-15:36/15:38:01-15:40/15:42-15:45/15:50/15:55-15:57/15:60/15:63/15:65-15:67/15:70-15:71/15:75-15:79N/15:81-15:85/15:87-15:89/15:92/15:94N-15:97/15:101-15:102/15:104-15:105/15:107/15:109-15:113/15:116-15:118/15:120-15:122/15:125-15:126/15:128-15:129/15:135-15:142/15:144-15:149N/15:152/15:154-15:155/15:157/15:159-15:160/15:164-15:167/15:169/15:171-15:172/15:174-15:175/15:178-15:179/15:181N-15:185/15:187/15:189-15:195/15:199/15:201/15:203-15:207/15:209N/15:211/15:213-15:215/15:217-15:218Q/15:222-15:223, 35:46, 44:08/44:57/44:60, 46:01:01-46:03/46:05-46:27, 51:104, 52:02, 55:35, 57:01:01/57:01:03-57:01:11/57:04/57:06/57:08/57:10-57:11/57:13-57:15/57:18-57:27/57:29-57:31/57:33/57:35-57:38/57:40-57:41/57:43-57:44	B13, -, B49/B15, Undefined, B62, Null, B75, B75/B62, B76, B77, B75/62, B63, B62/blank, B35, B44, B46, B22, B52, B57	see below
		*13:02:01-13:04/13:08Q-13:09/13:14-13:16/13:18-13:19/13:30-13:34/13:37-13:38/13:40-13:42/13:44-13:46, 15:04/15:42/15:83/15:137/15:155, 46:11/46:18, 51:104, 52:02, 55:35	B13, -, B49/B15, Undefined, B62, B22, B52	430 bp
		*13:04/13:10/13:26, 15:01:01:01-15:01:04/15:01:06-15:02:05/15:04-15:08/15:11:01-15:16:02/15:19-15:21/15:24-15:28/15:31-15:36/15:38:01-15:40/15:43-15:45/15:50/15:55-15:57/15:60/15:63/15:65-15:67/15:70-15:71/15:75-15:79N/15:81-15:82/15:84-15:85/15:87-15:89/15:92/15:94N-15:97/15:101-15:102/15:104-15:105/15:107/15:109-15:113/15:116-15:118/15:120-15:122/15:125-15:126/15:128-15:129/15:135-15:136/15:138-15:142/15:144-15:149N/15:152/15:154-15:155/15:157/15:159-15:160/15:164-15:167/15:169/15:171-15:172/15:174-15:175/15:178-15:179/15:181N-15:185/15:187/15:189-15:195/15:199/15:201/15:203-15:207/15:209N/15:211/15:213-15:215/15:217-15:218Q/15:222-15:223, 35:46, 44:08/44:57/44:60, 46:01:01-46:03/46:05-46:10/46:12-46:17/46:19-46:27, 57:01:01/57:01:03-57:01:11/57:04/57:06/57:08/57:10-57:11/57:13-57:15/57:18-57:27/57:29-57:31/57:33/57:35-57:38/57:40-57:41/57:43-57:44	B49/B15, B13, -, B62, Null, B75, B75/B62, B76, B77, B75/62, B63, Undefined, B62/blank, B35, B44, B46, B57	490 bp
F8	Mix 35	*57:01:01-57:01:09/57:01:11-57:10/57:12-57:35/57:37-57:44, 58:14	B57, -, Null, B58	see below
		*57:01:01-57:01:09/57:01:11-57:04/57:06-57:10/57:12-57:35/57:37-57:44, 58:14	B57, -, Null, B58	360 bp
		*57:04-57:05	B57	410 bp

Position on Tray	Mix	Specificities	Serology	Product Size
D8	Mix 36	*57:14, 58:01:01-58:01:04/58:01:06-58:02/58:04-58:26/58:28-58:34	-, B58, B17/B5, Null	490 bp
C11	Mix 37	*15:13/15:16:01w/15:67w/15:95w, 27:30w, 44:06w/44:18w/44:25w/44:50w, 49:01:01w-49:01:02w/49:03w-49:05w, 51:01:01-51:01:15/51:01:17-51:05/51:07:01-51:24:04/51:26-51:40/51:42w/51:43-51:44N/51:46w/51:48-51:53/51:55/51:56:01w/51:56:02-51:58/51:60-51:61/51:63/51:65-51:77/51:79-51:80/51:82-51:113, 52:01:01:01-52:19/52:21-52:24, 53:01:01-53:02/53:04-53:06/53:08:01-53:08:02/53:10/53:15-53:16/53:17:02-53:24, 54:12, 56:21, 57:05, 58:01:01-58:01:09/58:04-58:05/58:08-58:13/58:17N/58:19/58:21-58:24/58:28-58:34, 59:01:01:01-59:05	B77, B63, B27, B44, B49, B51, -, B5102/B51, B5103/B51, Null, B51/blank, Undefined, B52, B53, B53/B51, B57, B58, B17/B5, B59	330bp
B8	Mix 38	*35:01:10/35:04:02, 51:01:01-51:01:03/51:01:05-51:01:10/51:01:12/51:01:14-51:01:16/51:01:18-51:02:03/51:02:05-51:06:02/51:08-51:09:02/51:11N-51:12/51:13:02-51:14/51:16-51:21/51:23/51:24:03-51:24:04/51:26-51:41N/51:43/51:46/51:48-51:61/51:63-51:80/51:82-51:91/51:93-51:106/51:108-51:113, 78:01-78:02:02/78:04/78:07	B35, B51, -, B5102/B51, B5103/B51, Null, B51/blank, B78	450 bp
B8	Mix 39	*07:02:11/07:05:03, 15:09, 35:01:10/35:04:02, 51:01:01-51:01:03/51:01:05-51:01:12/51:01:14-51:02:03/51:02:05-51:09:02/51:11N-51:12/51:13:02-51:14/51:16-51:23/51:24:03-51:24:04/51:26-51:41N/51:43-51:44N/51:46/51:48-51:61/51:63-51:78/51:80/51:82-51:91/51:93-51:101/51:103-51:106/51:108-51:113, 55:01:04, 56:05:01-56:06/56:21, 78:01-78:04/78:07	B7, B70, B35, B51, -, B5102/B51, B5103/B51, Null, B51/blank, B55, B56, B78	460 bp
A8	Mix 40	*15:01:02, 40:01:06/40:26/40:28/40:95, 44:62, 51:07:01w, 52:01:01:01-52:01:04/52:01:06-52:05/52:07-52:13/52:15-52:17/52:19-52:24, 78:05-78:06	B62, B60, B21, Undefined, -, B51, B52	450 bp
H9	Mix 41	*07:02:11/07:05:03, 15:01:02/15:09, 35:01:10/35:04:02, 40:01:06/40:26/40:28/40:95, 55:01:04, 56:05:01-56:06, 78:01-78:07	B7, B62, B70, B35, B60, B21, Undefined, -, B55, B56, B78	410 bp
G9	Mix 42	*14:19, 15:09-15:10:02/15:18:01-15:18:04/15:21/15:23/15:37/15:51/15:72/15:80/15:90/15:99/15:108/15:115/15:119/15:133-15:134/15:153/15:176/15:189/15:197-15:198/15:200/15:221, 35:26/35:82/35:85/35:135, 38:30, 39:32-39:33, 51:22, 78:03	-, B70, B71, B75, B70/B5/blank, B35, B16, B39, B51, B78	575 bp
F9	Mix 43	*13:09, 15:01:01:01-15:01:04/15:01:06-15:01:20/15:01:22-15:02:05/15:04-15:08/15:11:01-15:12/15:14-15:15/15:19-15:21/15:25:01-15:28/15:30-15:35/15:38:01-15:40/15:42/15:44-15:45/15:48/15:50/15:55-15:56/15:58/15:60/15:63/15:65-15:66/15:70-15:71/15:73/15:75-15:79N/15:81-15:86/15:88/15:92/15:94N/15:96-15:97/15:101-15:102/15:104-15:105/15:107/15:110-15:113/15:116-15:118/15:120-15:122/15:125-15:126/15:128-15:129/15:135-15:142/15:144-15:150/15:152/15:154-15:155/15:159-15:160/15:164-15:167/15:169/15:171-15:172/15:174-15:175/15:178-15:179/15:181N-15:185/15:187-15:195/15:199/15:201/15:203-15:207/15:209N/15:211/15:213-15:215/15:217-15:219/15:223-15:224, 35:46, 40:21/40:137, 55:35, 57:12	Undefined, B62, Null, -, B75, B75/B62, B76, B75/62, B62/blank, B15, B35, B40/B15, B57	130 bp

Position on Tray	Mix	Specificities	Serology	Product Size
E9	Mix 44	*15:12/15:14/15:19, 44:08/44:57/44:60, 46:17, 57:07	B76, B44, -, B57	650bp
D9	Mix 45	*15:16:01-15:17:02/15:67/15:95/15:177/15:196/15:208/15:216, 57:13/57:22, 58:06/58:08/58:19	B63, -, B57, B58, B17/B5	530 bp
C9	Mix 46	*14:01:01-14:02:02/14:02:04-14:02:05/14:03-14:04/14:07N/14:09/14:11-14:12/14:14-14:20/14:23-14:24	B64, -, B65, B14, Null	400 bp
B9	Mix 47	*14:02:01-14:02:02/14:02:04-14:02:05/14:03/14:05-14:06:02/14:09/14:11/14:13/14:15-14:18/14:20/14:22-14:23, 15:189, 35:26, 38:05, 39:04	B65, B14, -, B35, B38, B39	185 bp
A9	Mix 48	*73:01-73:02	B73, -	300 bp

w = weak

**bold**: mixes which result in PCR fragments of different sizes (the specificities are first indicated all in one row, then split into different groups in the subsequent rows depending on their fragment size)

**Table 3:** Sizes of the PCR products and allele specificities of each HLA-C\* CTS- PCR-SSP Primer Mix (Lot No. C10-1) based on IMGT/HLA Sequence Database Release 3.4.0, April 2011

**Amplification control (internal positive control): 89 base pairs (bp)**

Position on tray	Mix	Amplified alleles	Serology	Product size
H10	Mix 1	*01:02:01-01:02:09/01:02:11-01:49/01:51-01:54	Cw1, -, Cw1/blank, Null	570 bp
G10	Mix 2	*01:10, 02:02:01-02:02:03/02:02:05-02:40/02:42/02:44-02:47, 03:34, 04:32/04:77, 06:08, 07:15, 08:31, 14:25, 16:29, 17:01:01-01-17:06/17:08-17:09, 18:03, B*07:13, B*46:06	Cw1, Cw2, -, Null, Cw10, Cw6, Cw7, Cw7/blank, Undefined, B7/blank	570 bp
F10	Mix 3	*03:02:01-03:15/03:17-03:40/03:42-03:57/03:59-03:79/03:81/03:83-03:85/03:87-03:93/03:95/03:97-03:98/03:100-03:112	Cw10, -, Cw9, Cw3, Undefined, Null	580 bp
E10	Mix 4	*03:02:01-03:06/03:08-03:13/03:16-03:24/03:26-03:43:01/03:44/03:46-03:57/03:59-03:81/03:83-03:85/03:88-03:93/03:95-03:98/03:100-03:101/03:103-03:112, 04:11/04:29/04:36/04:55, 14:02:01/14:02:03-14:03/14:05-14:11/14:13-14:16/14:18-14:31, 16:01:06	Cw10, -, Cw9, Cw3, Blank, Null, Undefined, Cw1/blank	450 bp
D10	Mix 5	*03:02:01-03:02:08/03:04:01:01-03:10/03:14/03:17/03:19/03:23-03:29/03:33-03:38:02/03:40/03:42/03:44/03:46-03:48/03:51/03:54/03:57/03:63-03:65/03:70-03:74/03:77-03:78/03:82/03:84/03:87/03:89-03:93/03:95/03:98/03:100-03:101/03:104-03:111, B*15:96	Cw10, -, Cw3, B62	535 bp
C10	Mix 6	*02:02:11, 04:01:01-01-04:01:22/04:01:24-04:01:29/04:01:31/04:03-04:14/04:15:02-04:20/04:23-04:36/04:38-04:72/04:74-04:79/04:81-04:82/04:84-04:90, 08:02:06/08:19, 12:10:01/12:31, B*37:01:06, B*67:02	Cw2, Cw4, -, Cw4/Cw6, Null, Undefined, B37	475 bp
B10	Mix 7	*04:09N	Null	138 bp
A10	Mix 8	*02:22, 05:01:01-01-05:01:01-02/05:01:03-05:01:16/05:03-05:19/05:21-05:31/05:33-05:58, 08:10, 16:02:05	-, Cw5, Null, Undefined	430 bp
H11	Mix 9	*05:01:01-01-05:01:16/05:03-05:11/05:13-05:17/05:19-05:28/05:30-05:44/05:46-05:47/05:50-05:58, 07:41w, 08:02:01-08:02:06/08:04-08:05/08:07/08:12/08:15:01-08:15:02/08:17/08:19/08:23/08:28-08:32/08:34/08:37/08:43/08:45/08:47-08:49	Cw5, -, Null, Undefined, Cw8	600 bp
G11	Mix 10	*06:02:01-01-06:02:01-02/06:02:03-06:22/06:24-06:29/06:31-06:34/06:36-06:46N/06:48/06:50-06:57/06:59-06:61, 07:31, 12:28, 16:26	Cw6, -, Undefined, Null, Cw7	310 bp

Position on tray	Mix	Amplified alleles	Serology	Product size
F11	Mix 11	*07:01:01-07:01:13/07:01:15-07:02:24/07:03-07:21/07:22w/07:23-07:25/07:27:01-07:32N/07:35-07:40/07:42-07:61N/07:62w/07:63/07:65-07:91/07:93-07:94/07:97-07:130/07:133-07:135/07:141-07:164N/07:166-07:175/07:177-07:187	Cw7, -, Null	720 bp
E11	Mix 12	*07:01:01-07:03/07:04:01w-07:04:02w/07:04:03/07:05-07:10/07:11w-07:12w/07:13-07:19/07:21/07:22w/07:23-07:29/07:31-07:33N/07:35-07:40/07:42-07:44/07:45w/07:46-07:63/07:65-07:67/07:68w/07:69-07:72/07:74-07:91/07:93-07:94/07:97-07:100/07:102-07:126/07:128-07:135/07:141/07:143-07:150Q/07:152N-07:164N/07:166-07:171/07:173-07:175/07:177-07:180/07:182-07:187, 08:14, B*07:51	Cw7, -, Null, Cw8, B7	675 bp
D11	Mix 13	*01:13, 03:87, 07:41, 08:01:01-08:09/08:11-08:26N/08:28-08:32/08:34/08:36N-08:38/08:40-08:50, 16:27, B*15:33/15:88/15:200	Cw1, -, Undefined, Cw8, Null, B62, B75	see below
		*01:13, 03:87, 07:41, 08:02:01-08:02:06/08:04-08:05/08:07/08:12-08:13/08:15:01-08:15:02/08:17-08:19/08:23/08:25/08:28-08:32/08:34/08:37/08:43/08:45/08:47-08:49, 16:27, B*15:33	Cw1, -, Undefined, Cw8, B62	460 bp
		*08:01:01-08:01:05/08:03:01-08:03:02/08:06/08:08-08:09/08:11/08:14/08:16/08:20-08:22/08:24/08:26N/08:36N/08:38/08:40-08:42/08:44/08:46/08:50, B*15:88/15:200	Cw8, -, Undefined, Null, B75	500 bp
C11	Mix 14	*01:04w/01:21, 12:02:01-12:02:05/12:08/12:10:01-12:10:02/12:14:02/12:16/12:18-12:19/12:22/12:27/12:30/12:36/12:40/12:44/12:56	Cw1, -, Undefined, Cw7	see below
		*12:19	Undefined	375 bp
		*01:04w/01:21, 12:02:01-12:02:05/12:08/12:10:01-12:10:02/12:14:02/12:16/12:18/12:22/12:27/12:30/12:36/12:40/12:44/12:56	Cw1, -, Undefined, Cw7	465 bp
B11	Mix 15	*01:04/01:21, 08:02:02, 12:02:01-12:03:01:02/12:03:03-12:03:07/12:03:09-12:03:15/12:04:02-12:08/12:10:01-12:13/12:14:02-12:18/12:20-12:25/12:27/12:29-12:31/12:34/12:36-12:58, 16:15:02	Cw1, -, Cw8, Undefined, Blank, Cw7, Null	420bp
A11	Mix 16	*02:12, 03:15/03:27/03:38:01-03:38:02/03:69, 04:03w/04:06w/04:16w, 06:03w, 07:26/07:92/07:96, 08:05/08:21/08:25, 12:02:01-12:03:12/12:03:14-12:03:16/12:04:01w-12:04:02w/12:06-12:08/12:10:01-12:15/12:18-12:20/12:22-12:32/12:34-12:40/12:42Q-12:48/12:50-12:53/12:56-12:58, 15:03w/15:16w/15:25, 16:15:01-16:15:02, 17:01:01:01w-17:01:03w/17:02w-17:06w, B*07:13/07:15, B*67:02	Cw2, Undefined, Cw10, -, Cw4/Cw6, Cw7, Cw8, Blank, Null, Cw7/blank, B7/blank	230 bp
H12	Mix 17	*02:05, 05:16, 06:02:01:01-06:02:01:02/06:02:03-06:02:11/06:02:13-06:10/06:12-06:22/06:24-06:34/06:36-06:46N/06:48/06:50-06:51/06:53-06:57/06:59-06:60, 12:04:01-12:05/12:09/12:33, 16:02:01-16:02:07/16:09/16:12/16:19/16:25	Cw2, Cw5, Cw6, -, Null, Blank, Undefined	340 bp

Position on tray	Mix	Amplified alleles	Serology	Product size
G12	Mix 18	*02:02:01-02:02:03/02:02:05-02:02:11/02:02:13-02:02:17/02:04-02:11/02:12w/02:13-02:15/02:17/02:19-02:26/03/02:28-02:31/02:33-02:40/02:42-02:47, 05:08/05:52, 06:02:01:01-06:02:01:02/06:02:03-06:02:11/06:02:13-06:03/06:07-06:10/06:12-06:39/06:41-06:51/06:53-06:60, 12:04:01-12:05/12:21/12:33/12:41, 18:03	Cw2, -, Null, Cw5, Cw6, Blank, Undefined	515 bp
F12	Mix 19	*04:01:30/04:15:01/04:37, 07:64, 12:55, 14:02:01-14:02:03/14:02:04w/14:02:05-14:18/14:20-14:31, 15:36	-, Cw4, Cw1/blank, Undefined, Null	575 bp
E12	Mix 20	<b>*02:06/02:23, 04:80, 05:10, 08:44, 12:15/12:44, 15:02:01-15:06:01/15:06:03-15:13/15:15-15:36/15:38-15:40/15:42/15:45-15:50, B*35:08:02, B*67:02</b>	Cw2, -, Cw5, Undefined, Cw3, B35	<b>see below</b>
		*04:80, 05:10, 08:44, 12:44, 15:02:01-15:06:01/15:06:03-15:13/15:15-15:21/15:23-15:36/15:38-15:40/15:42/15:45/15:47-15:50, B*35:08:02	-, Cw5, Undefined, Cw3, B35	445 bp
		*02:06/02:23, 12:15, 15:05:01-15:05:06/15:22-15:23/15:29/15:36/15:46, B*67:02	Cw2, -, Undefined	500 bp
D12	Mix 21	*16:01:01-16:02:07/16:04:01/16:06-16:18/16:20-16:21/16:23/16:25-16:34/16:36	Undefined, -, Null	470 bp
C12	Mix 22	<b>*17:01:01:01-17:01:01:02/17:02-17:05</b>	Cw7/blank, Undefined, -	<b>see below</b>
		*17:01:01:01-17:01:01:02/17:02-17:05	Cw7/blank, Undefined, -	920 bp
		*17:04	Undefined	610 bp
B12	Mix 23	*04:42, 07:08/07:108, 18:01-18:05	-, Cw7, Cw6/blank, Undefined	560 bp
A12	Mix 24	Negative Control	-	none (89bp)

w = weak

**bold:** mixes which result in PCR fragments of different sizes (the specificities are first indicated all in one row, then split into different groups in the subsequent rows depending on their fragment size)

**Table 4:** Amplification patterns for all detectable HLA-A specificities (Lot-No A13-3) based on IMGT/HLA Sequence Database Release 3.4.0, April 2011

Allele	Serology	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
A*01:01:01:01:01:01:07/01:01:09-01:01:10/01:01:12-01:01:14/01:01:16-01:04N/01:06-01:33/01:35-01:50/01:52N-01:68/01:70-01:71/01:73-01:84/01:86-01:93	A1, Null, -, Undefined	1																								
A*01:51	-	1												13												
A*02:01:01:01:02:01:08/02:01:10-02:01:11/02:01:13-02:01:15/02:01:18-02:01:19/02:01:21-02:01:25/02:01:27-02:01:32/02:01:34-02:01:39/02:01:41-02:01:51/02:01:53-02:01:56/02:01:58-02:05:02/02:06:01-02:06:06/02:06:08-02:11:01/02:11:03-02:11:04/02:14-02:16/02:18/02:20:01-02:22:02/02:24:01-02:26/02:28-02:33/02:36/02:39-02:43N/02:45/02:47/02:51/02:53N/02:57-02:59/02:61/02:63/02:66-02:69/02:71-02:77/02:79:01-02:79:02/02:81-02:87/02:89-02:97:02/02:99/02:101:01-02:102/02:104-02:107/02:109/02:111-02:113N/02:115-02:116/02:118/02:120-02:121/02:123-02:128/02:130-02:134/02:136-02:140/02:143-02:151/02:153-02:168/02:170-02:176/02:179-02:184/02:186-02:187/02:189-02:192/02:194/02:196-02:222N/02:224-02:228/02:230-02:245/02:247-02:253/02:255-02:272/02:274/02:276-02:277/02:280-02:285/02:287/02:289-02:297/02:299/02:302/02:305N-02:307	A2, Low A2, -, A203/A2, A210/A2, Null			3																					23	
A*02:01:09/02:05:05/02:06:07/02:11:02	A2, -			3																					21	
A*02:01:12	A2			3																						w
A*02:01:17/02:01:26/02:01:52/02:05:03/02:55/02:60:01 - 02:60:02/02:64/02:80/02:88N/02:114/02:117/02:119/02:169/02:177-02:178/02:185/02:188/02:193/02:195/02:223N/02:229/02:246/02:254/02:273/02:275/02:279/02:286/02:288/02:298/02:301N/02:304/02:308/02:311, A*03:89	A2, -, A2/A28, Null																									23
A*02:01:33/02:01:40/02:01:57/02:05:04/02:141/02:278	A2, -			3																						
A*02:12-02:13/02:19/02:27/02:37-02:38/02:44/02:49/02:54/02:142	A2, A2/blank, -			3											14											23
A*02:17:01-02:17:02/02:108/02:110/02:300/02:303	A2, -			3								11														23
A*02:34-02:35:01/02:56:01/02:62	A2			3																					22	23
A*02:35:02	A2																							22	w	
A*02:35:03	A2			3																		21	22			
A*02:46/02:70	A2			3			6																			23









**Table 5:** Amplification patterns for all **HLA-B** alleles detected by the **HLA-B\*** CTS-PCR-SSP reagents (**Lot-No B12-1**) based on IMGT/HLA Sequence Database Release 3.4.0, April 2011

Specificities	Serology	Mixes
*07:02:01-07:02:07/07:07:10/07:15/07:21-07:23/07:26/07:30-07:31/07:35-07:36/07:41-07:44/07:46-07:49N/07:51-07:52/07:55-07:59/07:61-07:64/07:66-07:68:01	B7, B7/B42, Null, –	<b>1+24w+28</b>
*07:02:08-07:02:10/07:02:12-07:02:20/07:13/07:32/07:68:02-07:77/07:79/07:81-07:89/07:91-07:93/07:95-07:96:02/07:98-07:99/07:101-07:104/07:106-07:111N/07:113-07:118/07:120-07:121/07:124-07:130, C*02:23, C*04:77, C*07:38	B7, –, B7/blank, Null, Cw7	<b>1</b>
*07:02:11	B7	<b>1+39+41</b>
*07:03/07:08/07:16/07:28/07:37-07:38	B703/B7, Undefined	<b>1+24w</b>
*07:04/07:25	B7	<b>1+23+24w+28</b>
*07:05:01-07:05:02/07:05:04-07:05:05/07:06/07:34/07:39/07:80/07:90/07:97/07:105/07:112	B7, –	<b>1+28</b>
*07:05:03	B7	<b>1+28+39+41</b>
*07:05:06/07:40/07:53/07:123, 55:04/55:13/55:17/55:28/55:49	–, B7, B55	<b>28</b>
*07:09	B7	<b>1+21+24w+28w</b>
*07:11	B7	<b>1+21+28w</b>
*07:12/07:18:01	B7	<b>1+7+19+24w+28</b>
*07:14	B7	<b>1+7w+19w+24w</b>
*07:17	B7	<b>1+21</b>
*07:18:02	B7	<b>1+7w+19w+24w+28</b>
*07:19	B7/42	<b>23+24w+28</b>
*07:20	B7/blank	<b>1+24w+25+28+30w</b>
*07:24	B7	<b>1+24w+28+30</b>
*07:27/07:50	Undefined	<b>1+15w+24w</b>
*07:29	B7	<b>1+2+24w+28</b>
*07:33/07:54	B7	<b>24w+28</b>
*07:45	B7	<b>1+12w+24w+28</b>
*07:60	–	<b>24w+28+30</b>
*07:65	–	<b>1+5+28</b>
*07:78	–	<b>1+27+28</b>
*07:100	–	<b>30</b>
*08:01:01-08:03/08:05/08:08N-08:12:02/08:13-08:16/08:18-08:25/08:27/08:29-08:31/08:33-08:34/08:36/08:38-08:44/08:46-08:47/08:51-08:53/08:56-08:57/08:59-08:61/08:64-08:70, C*02:14, C*07:01/07:04:03/07:14/07:27:02, C*12:16	B8, –, Null, Cw2, Cw7, Undefined	<b>2</b>
*08:04	B8/blank	<b>2+15w</b>
*08:07	B8	<b>2+24w</b>
*08:17/08:54	Undefined, –	<b>2+15</b>
*08:28/08:35/08:37, 15:180	B8, –	<b>2+21</b>
*08:32	B8	<b>2+5</b>

Specificities	Serology	Mixes
*08:49, 15:170, 35:01:20/35:03:03/35:100/35:103, 53:09, A*25:01:01-25:01:02/25:02-25:08, A*26:01:01-26:01:07/26:02-26:03:01/26:04-26:06/26:08-26:18/26:20-26:21/26:23-26:30/26:33-26:37, A*34:01:01-34:01:02/34:05-34:06, A*66:01-66:08, A*68:02:01:01-68:02:02/68:15/68:18N/68:23/68:27-68:28/68:31/68:34/68:40/68:44, C*15:27	-, B35, B53, A25, A26, A10, Null, A34, A66, A68	7
*08:55, 39:12	-, B39	2+12
*08:62	-	22
*13:01:01-13:01:06/13:06-13:07N/13:11-13:13/13:17/13:20/13:23/13:25/13:27-13:29/13:35/13:39/13:43	B13, -, Null	3
*13:02:01-13:02:10/13:08Q/13:10/13:14-13:16/13:18-13:19/13:26/13:30-13:34/13:38/13:41-13:42/13:44	B13, -	3+34
*13:03-13:04/13:37/13:40/13:45, 15:01:21/15:24/15:36/15:43/15:57/15:87/15:109/15:157/15:222, 46:01:05-46:01:06/46:23, 57:01:10/57:11/57:36	B49/B15, -, B62, Undefined, B57	34
*13:09	Undefined	3+27+34+43
*13:21	-	3+15
*13:36	-	3+7
*13:46	-	11+34
*14:01:01-14:01:02/14:04/14:07N/14:12/14:14/14:24	B64, -, B14, Null	46
*14:02:01-14:02:02/14:02:04-14:02:05/14:03/14:09/14:11/14:15-14:18/14:20/14:23	B65, B14, -	46+47
*14:05-14:06:02/14:13/14:22	B14, -	47
*14:19	-	42+46
*15:01:01:01-15:01:01:02N/15:01:03-15:01:04/15:01:06-15:01:20/15:01:22/15:04-15:06/15:20/15:25:01-15:28/15:32/15:34-15:35/15:38:01-15:40/15:50/15:56/15:60/15:63/15:65-15:66/15:70/15:75/15:77/15:79N/15:81-15:85/15:92/15:94N/15:96-15:97/15:102/15:104-15:105/15:110-15:111N/15:113/15:117-15:118/15:120/15:122/15:125/15:128-15:129/15:135/15:137-15:138/15:140/15:145-15:147/15:149N/15:152/15:154-15:155/15:159-15:160/15:164-15:167/15:169/15:171-15:172/15:174-15:175/15:178-15:179/15:181N-15:185/15:187/15:190N/15:192-15:193/15:195/15:199/15:201/15:203/15:205-15:206/15:211/15:217-15:218Q	B62, Null, -, B62/blank	34+43
*15:01:02	B62	34+40+41+43
*15:02:01-15:02:04/15:44/15:88/15:121/15:139/15:144/15:194/15:213-15:214/15:223	B75, -	7+20+34+43

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*15:02:05/15:08/15:11:01- 15:11:05/15:15/15:31/15:148/15:191/15:209N/15:2 15	-, B75/B62, B75/62, Null	<b>20+34+43</b>
*15:03:01- 15:03:03/15:29/15:47/15:49/15:52/15:54/15:61/15: 64/15:74/15:93/15:98/15:103/15:114/15:123/15:12 7/15:132/15:151/15:156/15:158/15:173, 18:37, 39:43, 56:31-56:32, C*07:46	B72, B70, B70/blank, Undefined, B71, - , Cw7	<b>21</b>
*15:07:01-15:07:02/15:33/15:45/15:78:01- 15:78:02/15:107/15:116/15:126/15:141/15:207	B62, -	<b>15+34+43</b>
*15:09	B70	<b>39+41+42</b>
*15:10:01/15:37/15:99	B71, B70	<b>24w+42</b>
*15:10:02/15:90/15:133, 39:33	B71, -, B39	<b>42</b>
*15:12/15:19	B76	<b>34+43+44</b>
*15:13	B77	<b>7+8+20+34+37</b>
*15:14	B76	<b>25+34+43+44</b>
*15:16:01/15:67/15:95	B63	<b>34+37w+45</b>
*15:16:02	-	<b>34+45</b>
*15:17:01:01- 15:17:02/15:177/15:196/15:208/15:216	B63, -	<b>45</b>
*15:18:01- 15:18:02/15:18:04/15:23/15:51/15:72/15:115/15:1 19/15:134/15:153/15:176/15:197- 15:198/15:200/15:221	B71, B70/B5/blank, -	<b>21+42</b>
*15:18:03	B71	<b>27+42</b>
*15:21	B75	<b>7+20+34+42+43</b>
*15:30/15:58/15:219	B62, -	<b>43</b>
*15:42	B15	<b>27+34+43</b>
*15:46/15:53/15:106/15:143	Undefined, -	<b>17+26</b>
*15:48	B62	<b>12w+43</b>
*15:55	B15	<b>15w+20+34+43</b>
*15:62/15:124, 48:02:01-48:02:02/48:25	Undefined, B71, B48/B70, -	<b>19+21</b>
*15:68, 48:14	Undefined, B48	<b>15+21</b>
*15:69/15:186, 39:07	B72, -, B16	<b>12+21</b>
*15:71/15:204	B62, -	<b>32+34+43</b>
*15:73/15:86/15:224	B62, Undefined, -	<b>27+43</b>
*15:76	Undefined	<b>20+28w+30+34+43</b>
*15:80	B70	<b>7w+19w+21+42</b>
*15:89	B77	<b>7+20+34</b>
*15:91/15:131/15:161	Undefined, -	<b>21+25</b>
*15:101	Undefined	<b>28w+30+34+43</b>
*15:108	B71	<b>12w+21+42</b>
*15:112	B75	<b>7w+20+34+43</b>
*15:136	-	<b>12w+34+43</b>
*15:142	-	<b>2+34+43</b>
*15:150/15:188, 40:21/40:137	-, B40/B15	<b>15+43</b>
*15:189	-	<b>20+34+42+43+47</b>

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*15:202, 18:01:09/18:01:12/18:07:02/18:26/18:29/18:41/18: 45/18:55/18:61, 35:05:02/35:10/35:12:03- 35:13/35:16/35:22/35:24:02/35:28/35:31/35:43:01- 35:44/35:51/35:67/35:69/35:79-35:80/35:86- 35:87/35:97-35:99/35:111/35:113-35:114/35:117- 35:118/35:120/35:125/35:149/35:151	-, B18/blank, B35, Undefined	<b>5</b>
*15:210	–	<b>21+32</b>
*15:212, 18:48, 35:63, 41:09, 44:03:06/44:05:02/44:10/44:14- 44:15/44:17/44:43:01-44:43:02/44:70/44:75/44:77- 44:78/44:82/44:107/44:123	-, Undefined, B44, B12	<b>17</b>
*18:01:01-18:01:08/18:01:10-18:01:11/18:01:13- 18:07:01/18:08/18:10-18:13/18:17N- 18:18/18:20/18:23N-18:25/18:27-18:28/18:31- 18:36/18:38-18:40/18:42-18:44/18:46-18:47/18:50- 18:53/18:58-18:60/18:63	B18, -, B18/blank, Null	<b>4+5</b>
*18:09/18:49/18:54/18:62	B18, –	<b>4</b>
*18:14/18:22	B18	<b>4+5+15w</b>
*18:15/18:19/18:30/18:57	B18, –	<b>4+5+32</b>
*18:21	Undefined	<b>4+5+15w+32</b>
*18:56	–	<b>4+5+25</b>
*27:01-27:03/27:05:02-27:05:16/27:07- 27:09/27:11-27:14/27:16-27:17/27:23/27:26- 27:28/27:31-27:33/27:35/27:37-27:39/27:42- 27:53/27:55-27:62/27:64N-27:67/27:70- 27:74/27:76-27:77/27:80	B27, -, B2708/B27/B7, Undefined, Null	<b>9</b>
*27:04:01- 27:04:03/27:10/27:15/27:20/27:25/27:40/27:54/27: 63/27:68-27:69/27:79	B27, –	<b>9+32</b>
*27:06/27:21	B27	<b>9+24w+32</b>
*27:18	Undefined	<b>9+18+32</b>
*27:19	B27	<b>9+19w</b>
*27:24	B27	<b>9+16+19+32</b>
*27:29	B27	<b>9+18</b>
*27:30	B27	<b>8w+9+19w+37w</b>
*27:34	B27	<b>9+24w+32</b>
*27:36	B27	<b>9+16+19</b>
*27:41/27:78	–	<b>9+21</b>
*35:01:01:01/35:01:02-35:01:03/35:01:05- 35:01:07/35:02:01-35:03:01/35:04:01/35:06- 35:08:01/35:09:01-35:09:02/35:11:01/35:14:01- 35:15/35:18/35:21/35:23-35:24:01/35:29/35:33- 35:34/35:36/35:38/35:40N- 35:42:01/35:48/35:50/35:52- 35:55/35:57/35:62/35:64- 35:65Q/35:70/35:74/35:77- 35:78/35:81/35:84/35:90- 35:94/35:129N/35:146/35:157/35:162	B35, B35/B78, Null, –	<b>5+7</b>

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*35:01:01:02/35:01:08-35:01:09/35:01:11-35:01:19/35:01:21-35:01:26/35:03:02/35:03:04-35:03:09/35:04:03/35:08:04/35:11:02/35:12:02/35:20:01/35:42:02/35:83/35:88/35:95-35:96/35:101:01-35:101:02/35:104-35:110/35:112/35:115-35:116/35:119/35:121-35:124/35:126-35:128/35:130N-35:134N/35:136-35:145N/35:147-35:148/35:150/35:152-35:153/35:155-35:156/35:158-35:161/35:163	-, B35, Null	<b>5+6+7</b>
*35:01:04/35:08:03	B35	<b>5+6+7w</b>
*35:01:10	B35	<b>5+7+38+39+41</b>
*35:04:02	B35	<b>5+6+7+38+39+41</b>
*35:05:01/35:17/35:30/35:32/35:37/35:58/35:68:01-35:68:02/35:75/35:89	B35, -	<b>5+6</b>
*35:08:02/35:27/35:56, 53:03/53:11-53:13	B35, B53/B35	<b>6+7</b>
*35:12:01/35:39/35:59/35:61	B35	<b>5+7w</b>
*35:19/35:47/35:154	B35/blank, -	<b>6+7+17</b>
*35:20:02	B35	<b>4+5+7</b>
*35:25/35:49	B35	<b>6+7+19+21</b>
*35:26	B35	<b>7+19+21+42+47</b>
*35:35	B35	<b>5+6+7+12</b>
*35:45/35:71	B35	<b>5+6+7+25</b>
*35:46	B35	<b>6+7+20+34+43</b>
*35:60	B35	<b>5+27</b>
*35:66	B35	<b>1+5+6</b>
*35:72	B35	<b>5+15w</b>
*35:76	B35/22	<b>5+7+28w+30</b>
*35:82/35:85	-	<b>5+7+42</b>
*35:135	-	<b>5+42</b>
*37:01:01-37:01:07/37:03N-37:05/37:13/37:15-37:29	B37, Null, -, Blank	<b>10</b>
*37:02	B37/B27	<b>10+18</b>
*37:06	B37	<b>10+17</b>
*37:07	Undefined	<b>15+32</b>
*37:08	B37	<b>7+10</b>
*37:09/37:12	B37	<b>10+15</b>
*37:10	B37	<b>10+11</b>
*37:11/37:14	Undefined, -	<b>5+10</b>
*38:01:01-38:04/38:06-38:16/38:18-38:25/38:27-38:29, A*24:96	B38, -	<b>11</b>
*38:05	B38	<b>11+47</b>
*38:26	-	<b>11+13</b>
*38:30	-	<b>11+42</b>
*39:01:01:01-39:01:01:02L/39:01:03-39:01:10/39:01:12-39:03/39:05:01-39:06:02/39:08-39:11/39:13:01-39:16/39:18/39:20/39:22-39:24:01/39:25N-39:28/39:31/39:35/39:37-39:41/39:44-39:46/39:48-39:49/39:51-39:63	B3901/B39, Low B39, -, B3902/B39, Null	<b>12</b>
*39:04	B39	<b>12+47</b>
*39:17	B39	<b>12+27</b>
*39:19:01-39:19:02	B39	<b>5+12</b>

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*39:29	B39	<b>12+24w</b>
*39:32	B16	<b>12w+42</b>
*39:42	B39	<b>7w+12+19w</b>
*40:01:01-40:01:05/40:01:08/40:01:10-40:01:13/40:01:15-40:01:18/40:22N/40:30/40:34/40:36/40:38/40:43/40:45/40:47/40:52/40:54-40:55/40:59-40:60/40:62/40:65-40:67/40:69/40:73-40:74/40:76/40:79-40:81/40:84/40:88/40:100/40:102/40:108/40:112-40:113/40:116-40:118N/40:123/40:125-40:126/40:128/40:130/40:134-40:135/40:139-40:141/40:147/40:149-40:155N/40:160	B60, -, Null, B40, Undefined	<b>14+15+16</b>
*40:01:06	B60	<b>14+15+16+40+41</b>
*40:01:07/40:01:19-40:01:20/40:10:01-40:10:02/40:49/40:85/40:114/40:138, 44:31	B60, -, B44	<b>14+15</b>
*40:01:09/40:01:14/40:07/40:61/40:87:01-40:87:02/40:146	-, B60	<b>14+16</b>
*40:02:01-40:02:04/40:02:06-40:04/40:06:01:01-40:06:03/40:11:01-40:11:02/40:14:01-40:14:03/40:19-40:20/40:27:01-40:27:02/40:29/40:35/40:37/40:40/40:50/40:53/40:56-40:58/40:64/40:70/40:72:01-40:72:02/40:78/40:82-40:83/40:86/40:89-40:91/40:94/40:96-40:99/40:103-40:105/40:107/40:109-40:111/40:119-40:120/40:122/40:127/40:129/40:131/40:143-40:145/40:157/40:159/40:161/40:164	B61, -, B60, B40, Null	<b>14+15+17</b>
*40:02:05/40:93, 42:11, 48:05/48:10/48:12-48:13	B61, -, B48, Undefined	<b>15</b>
*40:05	B4005/B50	<b>15+17+26+32</b>
*40:08/40:13/40:75/40:77/40:115/40:121/40:136/40:142N/40:162	B61/blank, Undefined, B60, -, Null	<b>14+17</b>
*40:09/40:18/40:24/40:44	B61	<b>14+15+17+24w</b>
*40:12, 48:01:01-48:01:03/48:03:01-48:04/48:07/48:09/48:11/48:15-48:21/48:24	B60/B48, -, Undefined	<b>15+19</b>
*40:15-40:16/40:148	Undefined, B61, -	<b>14+15+17+26+32</b>
*40:23	B40	<b>14+15+16+26+32</b>
*40:25	B40	<b>1+14+15w+16</b>
*40:26/40:28	B21, Undefined	<b>17+26+32+40+41</b>
*40:31/40:33/40:42	B60	<b>14+15+16+24w</b>
*40:32	B40	<b>14+15+17+24w+26+32</b>
*40:39/40:133Q, 41:08/41:15	B61/B41, -	<b>15+17</b>
*40:46, 48:22	B60, -	<b>15+16+19</b>
*40:48	B60	<b>14+15+16+27</b>
*40:51	Undefined	<b>15+16+26+32</b>
*40:63/40:92/40:101/40:156/40:163	B60, -	<b>15+16</b>
*40:68	Undefined	<b>7+14+17</b>
*40:71	B61	<b>15+17+27</b>
*40:95	-	<b>14+17+26+32+40+41</b>
*40:106	-	<b>1+14+16</b>

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*40:124:01-40:124:02	–	<b>9+14+15+16+18</b>
*40:132	–	<b>15+16+25</b>
*40:158	–	<b>14+17+26+32</b>
*41:01-41:03:02/41:05-41:07/41:10-41:11/41:13/41:18	B41, –	<b>15+17+22</b>
*41:04	B41	<b>15+17+22+24w</b>
*41:12/41:14/41:16-41:17	–	<b>17+22</b>
*42:01:01-42:01:02/42:04/42:06/42:08/42:10/42:12/42:14-42:15, 55:20	B42, –, B22	<b>23+28</b>
*42:02	B42	<b>22+23+28</b>
*42:05:01	B42	<b>1+23+28</b>
*42:05:02	B42	<b>1w+23+28</b>
*42:07/42:16	Undefined, –	<b>23</b>
*42:09	B42	<b>21+22+23+28w</b>
*42:13	–	<b>7+19+23+28</b>
*44:02:01:01-44:02:09/44:02:11-44:02:12/44:02:14-44:03:05/44:03:07-44:05:01/44:07/44:11/44:13/44:19N-44:20/44:22-44:24/44:26-44:30/44:32-44:33/44:35-44:39/44:41:01-44:42/44:45/44:47-44:48/44:51/44:55-44:56N/44:58N-44:59/44:61N/44:63/44:65-44:67/44:69/44:71-44:74/44:76/44:80-44:81/44:84-44:89/44:91-44:93/44:95-44:96/44:98-44:105/44:108N-44:109/44:112-44:114/44:116/44:118-44:122/44:124-44:128	B44, –, Null, Undefined	<b>17+24</b>
*44:02:10/44:09/44:34/44:46/44:90/44:129	B44, B45, B12, –	<b>17+24+25</b>
*44:06, 51:42	B44, Undefined	<b>7w+8w+25+37w</b>
*44:08/44:57/44:60	B44, –	<b>34+44</b>
*44:12	B44	<b>7w+17+24</b>
*44:16/44:21/44:64:01-44:64:02	B47/B44, –	<b>14+17+24</b>
*44:18, 49:01:02	B44, B49	<b>17+31+37w</b>
*44:25/44:50	B44	<b>8w+17+24+37w</b>
*44:40/44:44	B44	<b>19w+24</b>
*44:49	B44	<b>2+17+24</b>
*44:52N/44:68/44:94/44:115/44:130	Null, –	<b>24</b>
*44:53-44:54/44:106/44:110	B44, –	<b>15+17+24</b>
*44:62	–	<b>17+40</b>
*44:79	–	<b>17+24+26</b>
*44:97	–	<b>9+17+24</b>
*44:117	–	<b>11+17</b>
*45:01/45:03/45:05/45:07/45:11-45:13	B45, –	<b>17+25+27</b>
*45:02/45:09	B45, –	<b>17+25</b>
*45:04/45:08, 50:01:03	B21, –	<b>17+27</b>
*45:06	B45	<b>17+23+25+27+28+30w</b>
*45:10	–	<b>14+17+27</b>
*46:01:01-46:01:04/46:01:07-46:03/46:05/46:07N-46:10/46:12-46:13:03/46:15N-46:16/46:19-46:22/46:24-46:27	B46, –, Null	<b>33+34</b>
*46:04	B46	<b>33</b>

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*46:06	Undefined	<b>1+34</b>
*46:11/46:18	B22, –	<b>27+33+34</b>
*46:14	–	<b>32+33+34</b>
*46:17	–	<b>25+33+34+44</b>
*47:01:01:01-47:07	B47, –, Undefined, B17	<b>9+14+17+18</b>
*47:08	–	<b>9+17+18</b>
*48:06, 81:05	Undefined, –	<b>1+19</b>
*48:08	Undefined	<b>15+24w</b>
*48:23	–	<b>15+19+21</b>
*49:01:01	B49	<b>17+26+31+32+37w</b>
*49:01:03/49:12/49:17	–	<b>26+31+32</b>
*49:02, 50:09	B49, –	<b>17+26+32</b>
*49:03	B49	<b>31+32+37w</b>
*49:04-49:05	B49	<b>17+26+32+37w</b>
*49:06/49:08-49:09/49:13-49:16	–	<b>17+26+31+32</b>
*49:07	–	<b>14+17+26+31+32</b>
*49:10	–	<b>17+26+31</b>
*49:11	–	<b>17+31</b>
*50:01:01-50:01:02/50:04/50:08/50:11-50:12	B50, –	<b>17+26+27+32</b>
*50:02	B45	<b>17+25+26+27+32</b>
*50:05-50:07	–	<b>27+32</b>
*50:10/50:13	–	<b>17+26+27</b>
*51:01:01-51:01:03/51:01:05- 51:01:10/51:01:12/51:01:14-51:01:15/51:01:18- 51:02:03/51:02:05-51:03/51:05/51:08- 51:09:02/51:11N-51:12/51:14/51:16- 51:21/51:24:03-51:24:04/51:26-51:40/51:43/51:48- 51:53/51:55/51:57-51:58/51:60-51:61/51:63/51:65- 51:67/51:69-51:77/51:80/51:82-51:91/51:93- 51:101/51:105-51:106/51:109-51:113	B51, –, B5102/B51, B5103/B51, Null, B51/blank	<b>37+38+39</b>
*51:01:04/51:01:13/51:02:04/51:10/51:24:01- 51:24:02/51:107, 52:01:05/52:06:01- 52:06:02/52:18, 59:02	B51, B5102/B51, –, B52, B59	<b>37</b>
*51:01:11/51:01:17/51:07:02/51:44N	B51, –, Null	<b>37+39</b>
*51:01:16/51:06:01- 51:06:02/51:41N/51:54/51:59/51:64/51:78	B51, –, Null	<b>38+39</b>
*51:04/51:56:02	B51, –	<b>37+38+39</b>
*51:07:01	B51	<b>37+39+40w</b>
*51:13:01/51:92, 52:14, 59:03	B51, –	<b>11+37</b>
*51:13:02	B51	<b>11+37+38+39</b>
*51:15, 59:01:01:01-59:01:01:02/59:04-59:05	Undefined, B59, –	<b>31+37</b>
*51:22	B51	<b>37+39+42</b>
*51:23/51:108	B51, –	<b>25+37+38+39</b>
*51:46/51:56:01	B51, –	<b>7w+8w+37w+38+39</b>
*51:62	–	<b>31</b>
*51:68	–	<b>2+37+38+39</b>
*51:79/51:102	–	<b>37+38</b>
*51:103	–	<b>32+37+38+39</b>
*51:104	–	<b>20+34+37+38+39</b>
*52:01:01:01-52:01:04/52:01:06-52:01:09/52:03- 52:05/52:07-52:13/52:15-52:17/52:19/52:21-52:24	B52, –	<b>37+40</b>

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*52:02	B52	<b>34+37+40</b>
*52:20	–	<b>40</b>
*53:01:01-53:01:04/53:02/53:05- 53:06/53:08:01/53:10/53:15-53:16/53:19	B53, B53/B51, –	<b>6+7+8+37</b>
*53:01:05/53:08:02/53:18/53:20-53:24	B53, –	<b>7+8+37</b>
*53:04	B53	<b>6+7+8+11+37</b>
*53:07	B53	<b>7+11</b>
*53:14	–	<b>6</b>
*53:17:02, 58:01:05	–	<b>8+37</b>
*54:01:01- 54:02/54:05N/54:08N/54:10/54:13/54:16-54:23, 55:07	B54, –, Null	<b>27+28+29</b>
*54:03	B22	<b>27+28+29+30</b>
*54:04/54:11	B54	<b>28+29</b>
*54:06, 56:22	Undefined, –	<b>28w+30</b>
*54:07	B54	<b>27+28w+29</b>
*54:09	Undefined	<b>28w</b>
*54:12	Undefined	<b>28+29+31+37</b>
*54:14	–	<b>28w+29</b>
*54:15	–	<b>29</b>
*54:24	–	<b>27+29</b>
*55:01:01-55:01:03/55:01:05-55:03/55:05/55:09- 55:12/55:15-55:16/55:19/55:21-55:22/55:24- 55:26/55:29-55:31/55:33-55:34/55:36-55:38/55:40- 55:41/55:43/55:45-55:46/55:48/55:50, 56:10/56:19N	B55, –, B22, Null	<b>27+28</b>
*55:01:04	B55	<b>27+28+39+41</b>
*55:08/55:51, 56:07/56:15	B56, –	<b>28+30</b>
*55:14	Undefined	<b>21+28</b>
*55:18/55:47, 56:08/56:17/56:23, C*03:12/03:19, C*12:15, C*15:07	Undefined, –, B56, Cw9, Cw3	<b>27</b>
*55:23/55:32, 56:18	B55, –, Undefined	<b>21+28w</b>
*55:27	B55	<b>24w+28w</b>
*55:35	–	<b>27+28+34+43</b>
*56:01:01-56:02/56:04/56:16/56:20/56:24-56:30	B56, –, Null	<b>27+28+30</b>
*56:03	B22/15	<b>21+28w+30</b>
*56:05:01-56:05:02	B56	<b>28+30+39+41</b>
*56:06	B78	<b>5+28+30+39+41</b>
*56:09	B56	<b>7+19+21+28w+30</b>
*56:11	B56	<b>7+19+28w+30</b>
*56:12	B22	<b>7w+19w+28</b>
*56:13	B56	<b>23+27+28+30</b>
*56:14	B56	<b>27+33</b>
*56:21	–	<b>28+30+37+39</b>
*57:01:01/57:01:03- 57:01:09/57:01:11/57:04/57:06/57:08/57:10/57:15/ 57:18-57:21/57:23-57:27/57:29- 57:31/57:33/57:35/57:37-57:38/57:40-57:41/57:43- 57:44	B57, –	<b>34+35</b>
*57:01:02/57:02:01-57:03:02/57:09/57:16- 57:17/57:28N/57:32/57:34/57:39/57:42	B57, –, Null	<b>35</b>
*57:05	B57	<b>8+35+37</b>

<b>Specificities</b>	<b>Serology</b>	<b>Mixes</b>
*57:07	B57	<b>35+44</b>
*57:12	B57	<b>35+43</b>
*57:13/57:22	B57, –	<b>34+35+45</b>
*57:14	–	<b>34+35+36</b>
*58:01:01-58:01:04/58:01:06-58:01:09/58:04-58:05/58:09-58:13/58:17N/58:21-58:24/58:28-58:33	B58, –, B17, Null	<b>8+36+37</b>
*58:02/58:07/58:15-58:16/58:18/58:25-58:26	B58, –	<b>36</b>
*58:06	B58	<b>36+45</b>
*58:08	B17/B5	<b>36+37+45</b>
*58:14	B58	<b>35+36</b>
*58:19	–	<b>8+36+37+45</b>
*58:20	–	<b>11+36</b>
*58:34	–	<b>8+11+36+37</b>
*67:01:01-67:01:02	B67	<b>12+13+28</b>
*67:02	Undefined	<b>12+33</b>
*67:03	–	<b>12+13</b>
*73:01-73:02	B73, –	<b>48</b>
*78:01-78:02:02/78:04/78:07	B78, B35, –	<b>5+38+39+41</b>
*78:03	B78	<b>5+39+41+42</b>
*78:05	Undefined	<b>5+40+41</b>
*78:06	–	<b>40+41</b>
*81:01-81:04N	B81, –, Null	<b>1+19+28</b>
*82:01-82:02	B82	<b>23+25+27+28+30w</b>
*82:03	–	<b>25+27+28</b>
*83:01	Undefined	<b>7w+19w+23+24w+25+30w</b>

w = weak

**Table 6:** Amplification patterns of HLA-Cw and other HLA alleles detected by the HLA-Cw\* CTS-PCR-SSP primer mixes (Lot No. C10-1 based on IMGT/HLA Sequence Database Release 3.4.0, April 2011)

Specificities	Mix No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Serology																							
*01:02:01-01:02:09/01:02:11-01:03:01/01:05-01:09/01:11-01:12/01:14-01:20/01:22-01:49/01:51-01:54	Cw1, -, Cw1/blank, Null	1																						
*01:04	Cw1	1													14w	15								
*01:10	Cw1	1	2																					
*01:13	Cw1	1												13										
*01:21	-	1													14	15								
*02:02:01-02:02:03/02:02:05-02:02:10/02:02:13-02:02:17/02:04/02:07-02:11/02:13-02:15/02:17/02:19-02:21/02:24-02:26/03:02:28-02:31/02:33-02:40/02:42/02:44-02:47	Cw2, -, Null		2																18					
*02:02:11	Cw2		2				6												18					
*02:02:12/02:03/02:16:01-02:16:02/02:18/02:27:01-02:27:02/02:32, 17:01:04-17:01:05/17:08-17:09, B*46:06	-, Cw2, Undefined		2																					
*02:05	Cw2		2															17	18					
*02:06/02:23	Cw2, -		2																18		20			
*02:12	Cw2		2														16		w					
*02:22	-		2						8										18					
*02:43, 06:23/06:35/06:47/06:49N/06:58	-, Null																		18					
*03:02:01-03:02:08/03:04:01:01-03:06/03:08-03:10/03:17/03:19/03:23-03:24/03:26/03:28-03:29/03:33/03:35-03:37/03:40/03:42/03:44/03:46-03:48/03:51/03:54/03:57/03:63-03:65/03:70-03:74/03:77-03:78/03:84/03:89-03:93/03:95/03:98/03:100-03:101/03:104-03:111	Cw10, -, Cw3			3	4	5																		
*03:03:01-03:03:14/03:11:01-03:13/03:18/03:20N-03:22Q/03:30-03:32/03:39/03:43:01/03:49-03:50/03:52-03:53/03:55-03:56/03:59-03:62/03:66-03:68/03:75-03:76/03:79/03:81/03:83/03:85/03:88/03:97/03:103/03:112	Cw9, -, Null, Undefined, Cw10			3	4																			
*03:07/03:14/03:25	Cw3, Cw10			3		5																		
*03:15	Undefined			3													16							
*03:16/03:41/03:80/03:96, 14:19	Blank, Cw10, -				4																			
*03:27/03:38:01-03:38:02	Cw10			3	4	5											16							
*03:34	Cw10		2	3	4	5																		
*03:43:02/03:45/03:102	-			3																				
*03:69	-			3	4												16							
*03:82, B*15:96	-, B62					5																		
*03:87	-			3		5								13										
*04:01:01:01-04:01:22/04:01:24-04:01:29/04:01:31/04:04:01-04:05/04:07-04:08/04:10/04:12-04:14/04:15:02-04:15:03/04:17-04:20/04:23-04:28/04:30-04:31/04:33-04:35/04:38-04:41/04:43-04:54/04:56-04:72/04:74-04:76/04:78-04:79/04:81-04:82/04:84-04:90, B*37:01:06	Cw4, -, Null, B37						6																	
*04:01:30/04:15:01/04:37, 07:64, 14:02:02/14:04/14:12/14:17	-, Cw4, Cw1/blank, Undefined																			19				
*04:03/04:06/04:16	Cw4/Cw6						6										w							
*04:09N	Null						6	7																

Specificities	Mix No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Serology																							
*04:11/04:29/04:36/04:55	Undefined, -				4		6																	
*04:32/04:77	-		2				6																	
*04:42	-						6																	23
*04:80, 15:02:01-15:02:07/15:04-15:06:01/15:06:03-15:13/15:15/17-15:24/15:26-15:35/15:38-15:40/15:42/15:45-15:50, B*35:08:02	-, Undefined, Cw3, B35																				20			
*05:01:01:01-05:01:01:02/05:01:03-05:01:16/05:03-05:07N/05:09/05:11/05:13-05:15/05:17/05:19/05:21-05:28/05:30-05:31/05:33-05:44/05:46-05:47/05:50-05:51Q/05:53-05:58	Cw5, -, Null								8	9														
*05:01:02/05:20/05:32	Cw5, -									9														
*05:08/05:52	Cw5, -								8	9									18					
*05:10	Cw5								8	9											20			
*05:12/05:18/05:29/05:45/05:48N-05:49, 08:10	Cw5, -, Null, Undefined								8															
*05:16	Cw5								8	9									17					
*06:02:01:01-06:02:01:02/06:02:03-06:02:11/06:02:13-06:02:14/06:07/06:09-06:10/06:12-06:22/06:24-06:29/06:31-06:34/06:36-06:39/06:41-06:46N/06:48/06:50-06:51/06:53-06:57/06:59-06:60	Cw6, -, Null										10								17	18				
*06:02:12/06:11/06:52/06:61	-, Undefined										10													
*06:03	Cw6										10						w	17	18					
*06:04-06:06/06:40	Cw6, -										10								17					
*06:08	Cw6		2								10								17	18				
*06:30, 12:33	-																		17	18				
*07:01:01-07:01:13/07:01:15-07:02:24/07:03/07:04:03/07:05-07:07/07:09-07:10/07:13-07:14/07:16-07:19/07:21/07:23-07:25/07:27-07:29-07:32N/07:35-07:40/07:42-07:44/07:46-07:61N/07:63/07:65-07:67/07:69-07:72/07:74-07:91/07:93-07:94/07:97-07:100/07:102-07:107/07:109-07:126/07:128-07:130/07:133-07:135/07:141/07:143-07:150Q/07:152N-07:164N/07:166-07:171/07:173-07:175/07:177-07:180/07:182-07:187	Cw7, -, Null											11	12											
*07:01:14/07:02:25-07:02:26/07:33N/07:131-07:132, B*07:51	-, Null, B7												12											
*07:04:01-07:04:02/07:11-07:12/07:45/07:68	Cw7, -											11	w											
*07:04:04-07:04:05/07:20/07:30/07:73/07:101/07:127/07:142/07:151/07:172/07:181	-, Cw7											11												
*07:08/07:108	Cw7, -											11	12											23
*07:15	Cw7		2									11	12											
*07:22	Cw7											w	w											
*07:26	Cw7												12				16							
*07:31	Cw7										10	11	12											
*07:41	Undefined									w				13										
*07:62	-											w	12											
*07:92/07:96, 12:03:02/12:03:08/12:03:16/12:14:01/12:26/12:32/12:35, B*07:15	-, Undefined, Cw7, B7																16							
*08:01:01-08:01:05/08:03:01-08:03:02/08:06/08:08-08:09/08:11/08:13/08:16/08:18/08:20/08:22/08:24/08:26N/08:36N/08:38/08:40-08:42/08:46/08:50, B*15:33/15:88/15:200	Cw8, -, Undefined, Null, B62, B75													13										

Specificities	Mix No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Serology																							
*08:02:01/08:02:03-08:02:05/08:04/08:07/08:12/08:15:01-08:15:02/08:17/08:23/08:28-08:30/08:32/08:34/08:37/08:43/08:45/08:47-08:49	Cw8, -									9				13										
*08:02:02	Cw8									9				13		15								
*08:02:06/08:19	-						6			9				13										
*08:05	Cw8									9				13			16							
*08:14	Cw8												12	13										
*08:21/08:25	-													13			16							
*08:31	-		2							9				13										
*08:44	-													13							20			
*12:02:01-12:02:05/12:08/12:10:02/12:14:02/12:18/12:22/12:27/12:30/12:36/12:40/12:56	Undefined, -, Cw7														14	15	16							
*12:02:06-12:03:01:02/12:03:03-12:03:07/12:03:09-12:03:12/12:03:14-12:03:15/12:06-12:07/12:11-12:13/12:20/12:23-12:25/12:29/12:34/12:37-12:39N/12:42Q-12:43/12:45-12:48/12:50-12:53/12:57-12:58	-, Undefined, Null															15	16							
*12:03:13/12:17/12:49/12:54	-, Undefined															15								
*12:04:01	Blank																w	17	18					
*12:04:02	Blank															15	w	17	18					
*12:05	Undefined															15		17	18					
*12:09, 16:19	Undefined, -																	17						
*12:10:01	Undefined						6								14	15	16							
*12:15	Undefined															15	16				20			
*12:16	Undefined														14	15								
*12:19	Undefined														14		16							
*12:21/12:41	Undefined, -															15			18					
*12:28	-										10						16							
*12:31	-						6									15	16							
*12:44	-														14	15	16				20			
*12:55	-															15				19				
*14:02:01/14:02:03/14:02:05-14:03/14:05-14:11/14:13-14:16/14:18/14:20-14:24/14:26-14:31	Cw1/blank, -, Undefined, Null				4															19				
*14:02:04	Cw1/blank				4														w					
*14:25	-		2	4																19				
*15:03/15:16	Undefined																w				20			
*15:25	-																16				20			
*15:36	-																			19	20			
*16:01:01-16:01:05/16:04:01/16:06-16:08/16:10-16:11/16:13-16:14/16:16Q-16:18/16:20-16:21/16:23/16:28/16:30N-16:34/16:36	Undefined, -, Null																						21	
*16:01:06	-				4																		21	
*16:02:01-16:02:04/16:02:06-16:02:07/16:09/16:12/16:25	Undefined, -																		17				21	
*16:02:05	-								8										17				21	
*16:15:01	-																16						21	
*16:15:02	-															15	16						21	
*16:26	-										10												21	
*16:27	-													13									21	

Specificities	Mix No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Serology																							
*16:29	-		2																			21		
*17:01:01:01-17:01:01:02/17:02-17:05	Cw7/blank, Undefined, -		2														w						22	
*17:01:02-17:01:03/17:06	Cw7/blank, -		2														w							
*18:01-18:02/18:04-18:05	Cw6/blank, -																							23
*18:03	Undefined		2																18					23
B*07:13	B7/blank		2														16							
B*67:02	Undefined						6										16				20			

w = weak