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| Lot No. | A16-2 |


CTS Collaborative Transplant Study

WORKING INSTRUCTION

HLA-A* CTS-PCR-SSP TRAY KIT

LOCUS- AND LOT-SPECIFIC MANUAL

To be applied to the following product:

| Product No. | Description |
|-------------|---|
| 101 | HLA-A* CTS-PCR-SSP TRAY KIT  |

1. Main differences

- **Between Lot A16-2 (the current lot) and Lot A16-1**
 The kit was updated to cover new alleles included in the IMGT/HLA Sequence Database of January 2018. Deleted and renamed alleles were taken into consideration.

2. Introduction

- **Intended use:** This kit provides reagents for low/intermediate resolution HLA-A typing using the PCR-SSP method. All serologically detectable HLA-A alleles as well as their splits can be assigned. In addition, some of the DNA-specificities which so far could not be identified by serology can be detected.
 Allele coverage: IMGT/HLA Sequence Database Release 3.31.0, January 2018, except
 HLA- A*01:01:65-01:01:66/01:38/01:72/01:102/01:139/01:167/01:221, A*02:644, A*11:01:35/
 11:01:57/11:23-11:25:02/11:31/11:35/11:40/11:45/11:50Q/11:78N/11:98/11:111-11:112/11:176/
 11:183/11:191/11:211/11:223/11:226/11:229/11:250/11:258/11:269, A*24:129, A*25:01:09,
 A*26:60N/26:85/26:125/26:131/26:143-26:144, A*29:01:07/29:60/29:111, A*30:26/30:82/30:84,
 A*31:01:07/31:21-31:22/31:75/31:90/31:104/31:109, A*32:01:07/32:01:12/32:28/32:33:02-32:34/
 32:66/32:71/32:75/32:94, A*33:01:05/33:03:26-33:03:27/33:03:31/33:18:02-33:19/33:30/33:32:01-
 33:32:02/33:35/33:66/33:81/33:89/33:122/33:130/33:135, A*68:01:11/68:01:25/68:02:07/68:48-
 68:50/68:137, A*74:16:01, A*80:02
- Those alleles are considered to be rare and can be detected e. g. by sequencing with our CTS-SEQUENCE Kit (you may contact us for further information).
- This manual is only valid for **Lot No. A16-2**
- This manual should be used together with the Main Manual (General Information) which is the 'Working instruction for the CTS-PCR-SSP **TRAY and MINITRAY KITS**' (Manual No. 100A).

3. Content

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| Table 1: Sizes of the PCR products and allele specificities of each HLA-A* CTS-PCR-SSP primer mix (Lot No. A16-2) based on IMGT/HLA Sequence Database Release 3.31.0, January 2018 | 5 |
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| Table 2: Amplification patterns for all detectable HLA-A* specificities (Lot-No A16-2) based on IMGT/HLA Sequence Database Release 3.31.0, January 2018..... | 12 |
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4. Kit Composition

- Number of PCR primer mixes per test: 24 allele-specific mixes
- Number of tests per tray: 4
- Number of trays per kit: 10
- The primer mixes are aliquoted and lyophilized in thin-walled, red PCR trays.
- PCR buffer: 3.0 ml of Mastermix SSP (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.

5. 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.

6. 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.

7. Result Evaluation

- Check the approximate base pair size of the PCR product against the Primer Mix Specificity Table (Table 1) to confirm the correct product size.
- Use the Reaction Pattern Tables (Table 2) to make the allele assignments. Alternatively, you can use the SCORE Software (www.IHWG.org) for detailed result interpretation.

8. 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 MINI-TRAY KITS' (Manual No.: 100A) supplied along with this product.

9. Special notes

- The following mixes will give **short** PCR products (<200 bp): Mixes **5, 17, 20, 23 and 24**. These PCR products might be difficult to distinguish from the 90 bp amplification control (internal positive control)!
In general, these specific products will give a much stronger signal than that of the controls. Furthermore, they will not have migrated as far into the gel as the control bands. If you are not sure whether the strong signal is due to a specific or a generic PCR product, you might let the gel run for additional 15 minutes at a lower voltage. By this way the specific band will be separated from the control band, and you will be able to clearly see a double signal at this position: a very strong specific band, and a weaker, shorter amplification control band.
- Since mix **5** corresponds to A*23 and mix **23** to A*02 (both alleles/allele groups are common), it is recommended to 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).
- **Mix 4**: 225 bp and 235 bp (these two bands tend to merge into a single band). An additional weak band of 740 bp may occur, but is usually invisible.

10. 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.

11. 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.

12. 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:

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Hien Tran, M.D.

13. Appendix

Table 1: Sizes of the PCR products and allele specificities of each **HLA-A*** CTS-PCR-SSP primer mix (**Lot No. A16-2**) based on IMGT/HLA Sequence Database Release 3.31.0, January 2018

| Position | | | | Mix | Allele | Serology | Size |
|----------|----|----|-----|-------|--|---------------------------------|--------|
| H1 | H4 | H7 | H10 | Mix 1 | A*01:01:01:01-01:01:64/01:01:67-01:04N/01:06-01:33/01:35-01:37/01:39-01:71/01:73-01:101/01:103-01:138/01:140-01:166/01:168-01:199/01:201-01:220/01:222-01:243, A*11:27/11:38-11:39/11:94/11:209, A*23:31/23:45/23:55, A*24:15/24:41/24:51/24:92/24:235, A*25:36, A*26:29/26:49, A*32:13, A*66:10, B*07:64, B*15:12/15:19/15:270/15:298/15:304N | A1, Null, -, A26(10), B76(15) | 225 bp |
| G1 | G4 | G7 | G10 | Mix 2 | A*01:200/01:244, A*02:609w, A*03:107/03:164, A*11:17, A*26:72, A*32:24, A*36:01-36:05 | -, A36 | 580 bp |
| F1 | F4 | F7 | F10 | Mix 3 | A*02:01:01:01-02:01:15/02:01:18-02:01:19/02:01:21-02:01:25/02:01:27-02:01:51/02:01:53-02:01:63/02:01:65w/02:01:66-02:01:68/02:01:69w/02:01:70-02:01:73/02:01:75-02:01:80/02:01:83-02:01:94/02:01:95w/02:01:96-02:03:06/02:03:08-02:05:02/02:05:04-02:06:11/02:06:13-02:06:18/02:06:19w/02:06:20-02:11:06/02:11:07w/02:11:08-02:22:02/02:24:01-02:35:01/02:35:03-02:47/02:49/02:51/02:53N-02:54/02:56:01/02:57-02:63/02:66-02:71/02:73-02:79:02/02:81-02:87/02:89-02:97:02/02:99/02:101:01-02:102/02:104/02:105w/02:106-02:113:02N/02:115-02:116/02:118/02:120-02:121/02:123-02:128/02:130-02:134/02:136-02:151/02:153:01-02:168/02:170-02:177/02:179-02:184/02:186-02:187/02:189-02:192/02:193w/02:194/02:196-02:222N/02:224-02:228/02:230-02:245/02:247-02:272/02:273w/02:274/02:276-02:278/02:280-02:285/02:286w/02:287/02:289:01/02:290-02:297/02:299-02:300/02:302-02:303/02:305N-02:307/02:308w/02:310/02:311w/02:312-02:327/02:328w/02:329-02:338/02:340-02:347/02:349-02:376/02:378-02:382/02:384-02:405/02:407-02:411/02:413-02:453/02:455-02:487/02:488w/02:489-02:490N/02:492-02:503/02:505-02:509/02:511-02:526/02:528:01-02:570/02:572-02:581/02:583-02:590/02:591:02-02:600/02:602-02:621/02:622Nw/02:623-02:640/02:642/02:645-02:661/02:663-02:675N/02:677/02:679-02:680/02:682-02:706, A*24:02:76/24:310:02 | A2, Low A2, -, A203, A210, Null | 455 bp |

| Position | | | | Mix | Allele | Serology | Size |
|----------|----|----|-----|-------|--|---|--------------------------|
| E1 | E4 | E7 | E10 | Mix 4 | A*01:13/01:176/01:194, A*03:01:01:01-03:193/03:195-03:199/03:201-03:259/03:261-03:289, A*11:130/11:199:01/11:222, A*30:55/30:89, A*32:04/32:17w/32:52, A*34:08, A*36:02, A*68:71, A*74:13 | -, A3, Null | see below |
| | | | | | A*01:13/01:176/01:194, A*03:01:01:01-03:01:07/03:01:09-03:01:11/03:01:13-03:01:22/03:01:24-03:07:02/03:10-03:11N/03:13-03:31/03:33-03:35/03:37-03:40/03:42-03:56/03:58/03:60-03:71/03:73-03:87/03:90-03:106/03:110/03:112-03:127/03:129N-03:141/03:143-03:148/03:150-03:151/03:153-03:171/03:174-03:175/03:177/03:181-03:193/03:195/03:197N/03:201-03:202/03:204/03:206-03:210/03:212-03:215/03:217-03:218/03:220/03:222-03:242/03:244/03:246-03:251/03:253-03:258/03:261-03:266N/03:268-03:272/03:274-03:289, A*11:199:01/11:222, A*30:55, A*32:17w, A*34:08, A*68:71, A*74:13 | -, A3, Null | 225 bp |
| | | | | | A*03:01:01:01-03:01:11/03:01:13-03:01:29/03:01:31-03:01:34/03:01:36-03:01:49/03:01:51-03:04:03/03:07:01-03:09/03:11N/03:13-03:17:02/03:19-03:39/03:41/03:43-03:58/03:60-03:71/03:73-03:87/03:89:02-03:96/03:99-03:104/03:106-03:121/03:123:01-03:134/03:136-03:148/03:150-03:166/03:168N-03:178N/03:181-03:186/03:188-03:193/03:195/03:197N-03:199/03:201-03:204/03:206-03:207/03:209-03:220/03:222-03:224/03:226-03:242/03:244/03:246-03:259/03:261-03:288, A*32:04/32:52, A*36:02 | A3, Null, - | weak or absent 740 bp |
| | | | | | A*03:01:01:01-03:01:05/03:01:07-03:01:29/03:01:31-03:01:34/03:01:36-03:01:48/03:01:51-03:04:03/03:07:01-03:09/03:11N-03:17:02/03:19-03:39/03:41/03:43-03:74/03:76-03:83/03:85-03:94/03:96/03:99-03:104/03:107-03:121/03:123:01-03:134/03:136-03:166/03:168N-03:176/03:178N-03:186/03:188-03:193/03:195-03:199/03:201-03:203/03:205-03:207/03:209-03:214/03:216-03:224/03:226-03:234Q/03:236-03:248/03:250-03:259/03:261-03:287, A*11:130, A*30:89, A*32:04, A*36:02 | A3, Null, - | 235 bp |
| D1 | D4 | D7 | D10 | Mix 5 | A*23:01:01:01-23:23/23:25-23:33/23:35-23:56/23:58-23:65/23:67-23:68/23:70-23:83, A*24:24/24:71/24:315/24:392, A*29:07/29:49, A*31:29, B*18:27 | A23(9), -, Null | 195 bp |
| C1 | C4 | C7 | C10 | Mix 6 | A*02:46/02:48/02:70/02:129/02:571, A*03:30/03:152/03:273, A*23:01:01:01-23:02/23:04-23:08N/23:10-23:22/23:24-23:27/23:29-23:36/23:38N-23:50/23:52-23:60/23:62-23:68/23:70-23:79/23:81-23:82, A*24:02:01:01-24:02:16/24:02:18-24:02:48/24:02:50-24:02:63/24:02:64w/24:02:65/24:02:66w/24:02:67-24:02:88/24:02:90-24:07:02/24:09N-24:11N/24:13:01-24:15/24:17-24:20:01:02/24:22-24:23/24:25-24:28/24:30/24:32-24:41/24:43-24:64/24:66/24:68-24:76/24:78-24:88/24:90:01N-24:128/24:130-24:155N/24:157/24:159-24:190/24:192-24:199/24:201-24:210/24:212-24:236/24:238-24:272/24:274-24:289/24:291-24:308/24:311-24:325/24:327-24:341/24:343w/24:344-24:358/24:360-24:369/24:371-24:388N/24:390-24:391/24:393-24:394, A*31:08, A*32:79, A*33:21/33:53 | A2, -, A23(9), Null, A24(9), Low A24(9), A2403, A9, A24(9)/A3 | see below |
| | | | | | A*03:30/03:152/03:273, A*23:31/23:45/23:53/23:70, A*24:17/24:41/24:62/24:106/24:208/24:296/24:330, A*31:08, A*32:79, A*33:21/33:53 | -, A24(9) | 435 bp |
| | | | | | A*02:46/02:48/02:70/02:129/02:571, A*23:01:01:01-23:02/23:04-23:08N/23:10-23:22/23:24-23:27/23:29-23:36/23:38N-23:50/23:52-23:60/23:62-23:68/23:71-23:79/23:81-23:82, A*24:02:01:01-24:02:16/24:02:18-24:02:48/24:02:50-24:02:63/24:02:64w/24:02:65/24:02:66w/24:02:67-24:02:88/24:02:90-24:07:02/24:09N-24:11N/24:13:01-24:15/24:17-24:20:01:02/24:22-24:23/24:25-24:28/24:30/24:32-24:41/24:43-24:64/24:66/24:68-24:76/24:78-24:88/24:90:01N-24:128/24:130-24:155N/24:157/24:159-24:190/24:192-24:199/24:201-24:207:02/24:209-24:210/24:212-24:236/24:238-24:272/24:274-24:289/24:291-24:308/24:311-24:325/24:327-24:341/24:343w/24:344-24:358/24:360-24:369/24:371-24:388N/24:390-24:391/24:393-24:394 | A2, -, A23(9), Null, A24(9), Low A24(9), A2403, A9, A24(9)/A3 | 470 bp |

| Position | | | | Mix | Allele | Serology | Size |
|----------|----|----|-----|--------|---|---|-----------|
| B1 | B4 | B7 | B10 | Mix 7 | A*11:178/11:190, A*24:02:01:01-24:02:73/24:02:75-24:03:04/24:05:01-24:05:02/24:07:01-24:11N/24:14:01:01-24:15/24:17/24:20:01:01-24:21:03/24:23/24:25-24:27/24:29-24:43/24:45N-24:64/24:66-24:86N/24:88/24:90:01N-24:93/24:95-24:106/24:108/24:110-24:128/24:130-24:137/24:139-24:166/24:168-24:187/24:189-24:206/24:208-24:210/24:212-24:226:02/24:229-24:277/24:278Nw/24:279-24:284/24:286-24:288/24:291-24:298/24:300-24:314/24:316-24:338/24:340-24:354/24:356-24:372/24:374-24:378/24:380/24:382-24:391/24:393-24:394, A*25:04/25:44, A*32:02/32:22, B*51:05w/51:55 | -, A24(9), Low A24(9), A2403, A9, Null, A32(19), B51(5) | 510 bp |
| A1 | A4 | A7 | A10 | Mix 8 | A*02:52/02:135/02:309/02:454, A*25:01:01:01-25:01:01:02/25:01:02w/25:01:03-25:01:08/25:01:10-25:10/25:11w/25:12N-25:23/25:25-25:32/25:34-25:42N/25:44-25:46, A*30:01:01-30:02:11/30:02:13-30:04:01/30:06-30:20/30:22-30:25/30:27N-30:81/30:83/30:85-30:89/30:91-30:95/30:97-30:99/30:02:12/30:101Q-30:123N/30:125-30:127, A*32:101Q, B*07:225w/07:260w, C*04:01:49 | -, A25(10), Null, A30(19) | see below |
| | | | | | A*02:52, A*30:01:01-30:02:09/30:02:11/30:02:13-30:04:01/30:06-30:20/30:22-30:25/30:27N-30:81/30:83/30:85-30:89/30:91-30:95/30:97-30:99/30:02:12/30:101Q-30:123N/30:125-30:127 | -, A30(19), Null | 550 bp |
| | | | | | A*02:135/02:309/02:454, A*30:02:10, C*04:01:49 | - | 560 bp |
| | | | | | A*32:101Q, B*07:225w/07:260w | - | 395 bp |
| | | | | | A*25:01:01:01-25:01:01:02/25:01:02w/25:01:03-25:01:08/25:01:10-25:10/25:11w/25:12N-25:23/25:25-25:32/25:34-25:42N/25:44-25:46 | A25(10), -, Null | 405 bp |
| H2 | H5 | H8 | H11 | Mix 9 | A*02:135/02:309/02:454, A*25:01:01:01-25:01:07/25:01:08w/25:01:10-25:13/25:15-25:38/25:39w/25:40-25:42N/25:44-25:46, A*26:01:01:01-26:01:26/26:01:28-26:01:37/26:01:38w/26:01:39-26:18/26:20-26:30/26:32-26:43:02/26:45-26:59/26:61-26:71N/26:73-26:75/26:76w/26:77-26:83/26:86-26:124/26:126-26:130/26:132-26:142/26:143w/26:145N-26:149, A*34:01:01-34:11/34:13-34:17, A*66:01:01:01-66:22/66:24-66:29, B*38:02:04 | -, A25(10), Null, A26(10), A10, A34(10), A66(10) | see below |
| | | | | | A*02:135/02:309/02:454, A*25:46, A*26:07:01-26:07:02/26:92 | -, A26(10) | 450 bp |
| | | | | | A*25:01:01:01-25:01:07/25:01:08w/25:01:10-25:13/25:15-25:38/25:39w/25:40-25:42N/25:44-25:45, A*26:01:01:01-26:01:26/26:01:28-26:01:37/26:01:38w/26:01:39-26:06/26:08-26:18/26:20-26:30/26:32-26:43:02/26:45-26:59/26:61-26:71N/26:73-26:75/26:76w/26:77-26:83/26:86-26:91/26:93-26:124/26:126-26:130/26:132-26:142/26:143w/26:145N-26:149, A*34:01:01-34:11/34:13-34:17, A*66:01:01:01-66:22/66:24-66:29, B*38:02:04 | A25(10), -, Null, A26(10), A10, A34(10), A66(10) | 445 bp |
| G2 | G5 | G8 | G11 | Mix 10 | A*01:01:56, A*02:135/02:309/02:454, A*25:11, A*26:01:01:01-26:01:01:09/26:01:03-26:01:12/26:01:14-26:32/26:34-26:43:02/26:45-26:59/26:61-26:84/26:86-26:109/26:111-26:124/26:126-26:130/26:132-26:142/26:143w/26:145N-26:149, A*30:02:10, A*43:01 | -, A26(10), Null, A10, A43 | see below |
| | | | | | A*02:135/02:309/02:454, A*25:11, A*26:03:01/26:06/26:21/26:30/26:36/26:78/26:92/26:111/26:146 | -, A26(10) | 415 bp |
| | | | | | A*01:01:56, A*26:01:01:01-26:01:01:09/26:01:03-26:01:12/26:01:14-26:02:02/26:04-26:05/26:07:01-26:20/26:22-26:29/26:31-26:32/26:34-26:35/26:37-26:43:02/26:45-26:59/26:61-26:77/26:79-26:84/26:86-26:91/26:93-26:109/26:112-26:124/26:126-26:130/26:132-26:142/26:143w/26:145N/26:147-26:149, A*30:02:10, A*43:01 | -, A26(10), Null, A10, A43 | 405 bp |

| Position | | | | Mix | Allele | Serology | Size |
|----------|----|----|-----|--------|---|--|-----------|
| F2 | F5 | F8 | F11 | Mix 11 | A*02:17:01-02:17:04/02:108/02:110/02:268w/02:300/02:303/02:617/02:657/02:680, A*11:139, A*23:04/23:83, A*24:03:01-01-24:03:04/24:10:01-24:10:02/24:18/24:22/24:33/24:94/24:125/24:138/24:167/24:204/24:207:01-24:207:02/24:210/24:289/24:299-24:300/24:315/24:339-24:340/24:374/24:387, A*26:48/26:69, A*29:07/29:49, A*31:29, A*34:01:01-34:01:02/34:05/34:11-34:12/34:14/34:16-34:17, B*18:27w, C*04:232 | A2, -, A23(9), A2403, A24(9)/A3, A9, A34(10) | see below |
| | | | | | A*02:268w, A*26:48/26:69, A*34:01:01-34:01:02/34:05/34:11-34:12/34:14/34:16-34:17 | -, A34(10) | 580 bp |
| | | | | | A*02:17:01-02:17:04/02:108/02:110/02:268w/02:300/02:303/02:617/02:657/02:680, A*11:139, A*23:04/23:83, A*24:03:01-01-24:03:04/24:10:01-24:10:02/24:18/24:22/24:33/24:94/24:125/24:138/24:167/24:204/24:207:01-24:207:02/24:210/24:289/24:299-24:300/24:315/24:339-24:340/24:374/24:387, A*29:07/29:49, A*31:29, B*18:27w, C*04:232 | A2, -, A23(9), A2403, A24(9)/A3, A9 | 245 bp |
| E2 | E5 | E8 | E11 | Mix 12 | A*03:103:01-03:103:02/03:282, A*11:116/11:140, A*25:02, A*26:13/26:19/26:33, A*29:32, A*31:89/31:115, A*32:17, A*33:125/33:131, A*34:01:01-34:01:02/34:05-34:06/34:11-34:12/34:14/34:16-34:17, A*66:01:01-66:02/66:04/66:06-66:14/66:16-66:27N/66:29, A*74:13 | -, A25(10), A34(10), A66(10), Null | 415 bp |
| D2 | D5 | D8 | D11 | Mix 13 | A*01:51, A*03:24, A*11:10, A*25:43, A*33:49, A*34:02:01-34:04/34:07-34:10N/34:13/34:15, A*68:103:01-68:103:02 | -, A3, A11, A34(10), Null | 385 bp |
| C2 | C5 | C8 | C11 | Mix 14 | A*02:12-02:13/02:19/02:27/02:37-02:38/02:44/02:49/02:54/02:142/02:226N/02:271/02:280/02:417/02:543/02:630/02:662/02:682-02:683, A*03:02:01w-03:02:04w/03:10/03:31w-03:32w/03:65w/03:69Nw/03:73w/03:76w/03:82w/03:90w/03:106w/03:113w/03:160w/03:167/03:198w/03:218w/03:223w/03:225/03:236w-03:237w/03:242w/03:244w/03:253w/03:274w-03:275Nw/03:281w/03:285w, A*11:01:01-11:01:34/11:01:36-11:01:56/11:01:58-11:16/11:18-11:22/11:23w/11:26-11:27/11:29-11:30/11:32:01-11:34/11:36-11:39/11:41-11:44/11:46-11:49/11:51-11:52Q/11:54-11:77/11:79-11:93/11:95-11:97/11:98w/11:99N-11:110/11:113-11:129/11:130w/11:131-11:157/11:159-11:175/11:177/11:179-11:182Q/11:184-11:189/11:192-11:210N/11:212-11:222/11:224-11:225/11:227-11:228/11:229w/11:230-11:249/11:250w/11:251N-11:257/11:258w/11:259-11:268, A*24:19/24:28/24:44/24:89/24:290/24:379, A*31:24w/31:97w, A*33:19w/33:59w/33:102w, A*66:19, A*68:09/68:26/68:28/68:129/68:134, A*69:03 | A2, -, Null, A3, A11, A9, A24(9), A28 | 520 bp |
| B2 | B5 | B8 | B11 | Mix 15 | A*03:01:39, A*29:01:01-29:01:06/29:01:08-29:59/29:61-29:110/29:111w, A*32:30:01-32:30:02/32:32, A*68:01:28/68:130:02, A*74:10 | -, A29(19), Null | see below |
| | | | | | A*29:01:01-29:01:06/29:01:08-29:12/29:14-29:18/29:20-29:38/29:40-29:47/29:49-29:59/29:61-29:97/29:99-29:110/29:111w, A*74:10 | A29(19), Null, - | 160 bp |
| | | | | | A*03:01:39, A*29:01:01-29:01:06/29:01:08/29:02:01-29:31/29:33-29:59/29:61-29:110/29:111w, A*32:30:01-32:30:02/32:32, A*68:01:28/68:130:02 | -, A29(19), Null | 515 bp |
| A2 | A5 | A8 | A10 | Mix 16 | A*30:01:01-30:01:07/30:01:08w/30:01:09-30:02:09/30:02:11/30:02:13-30:04:02/30:06-30:11:02/30:13-30:17/30:19-30:20/30:22-30:25/30:27N-30:40/30:42-30:54/30:56-30:81/30:83/30:85-30:99/30:02:12/30:101Q-30:127 | A30(19), -, Null | 570 bp |
| H3 | H6 | H9 | H12 | Mix 17 | A*29:14, A*31:01:02:01-31:01:06/31:01:08-31:07/31:09-31:20/31:23-31:74/31:76-31:88/31:91-31:103/31:104w/31:105-31:108/31:110-31:133 | -, A31(19), Null | 185 bp |

| Position | | | | Mix | Allele | Serology | Size |
|----------|----|----|-----|--------|--|--------------------------------------|-----------|
| G3 | G6 | G9 | G12 | Mix 18 | A*03:152/03:219, A*23:03:01/23:83, A*24:18/24:21:03/24:204/24:208/24:213, A*29:13, A*31:07-31:08/31:10, A*32:01:01-32:01:06/32:01:08-32:01:11/32:01:13-32:27N/32:29-32:30:01/32:31-32:33:01/32:35-32:65/32:67-32:70/32:72-32:74/32:75w/32:76-32:93/32:94w/32:95-32:100/32:102-32:107 | -, A24(9)/A3, A31(19), A32(19), Null | see below |
| | | | | | A*23:03:01/23:83, A*24:21:03/24:208, A*29:13, A*31:07-31:08/31:10, A*32:01:01-32:01:06/32:01:08-32:01:11/32:01:13-32:03/32:05-32:27N/32:29-32:30:01/32:31-32:33:01/32:35-32:65/32:67-32:70/32:72-32:74/32:75w/32:76-32:93/32:94w/32:95-32:100/32:102-32:107 | -, A31(19), A32(19), Null | 410 bp |
| | | | | | A*03:152/03:219, A*24:18/24:204/24:213, A*32:04/32:52 | -, A24(9)/A3 | 520 bp |
| F3 | F6 | F9 | F12 | Mix 19 | A*02:24:02/02:65/02:152/02:507, A*29:48/29:105, A*32:15/32:93, A*33:01:01-33:01:04/33:01:06-33:01:10/33:03:01-33:03:25/33:03:26w/33:03:28-33:03:30/33:03:31w/33:03:32-33:18:01/33:20/33:22-33:29/33:31/33:33-33:34/33:36-33:37/33:39-33:52/33:54-33:65/33:66w/33:67-33:80N/33:82-33:88/33:90-33:121/33:123N-33:129N/33:131-33:134/33:136-33:137, A*74:04/74:21, B*07:02:40, B*08:01:07, B*15:02:07, B*55:02:10 | -, A2/19, A33(19), A19, Null, B8 | see below |
| | | | | | A*02:24:02/02:65/02:152/02:507, A*29:48, A*32:93, A*33:08-33:09, A*74:04/74:21 | -, A2/19, A33(19), A19 | 475 bp |
| | | | | | A*29:105, A*32:15, A*33:01:01-33:01:04/33:01:06-33:01:10/33:03:01-33:03:25/33:03:26w/33:03:28-33:03:30/33:03:31w/33:03:32-33:07/33:10-33:18:01/33:20/33:22-33:29/33:31/33:33-33:34/33:36-33:37/33:39-33:52/33:54-33:65/33:66w/33:67-33:80N/33:82-33:88/33:90-33:121/33:123N-33:129N/33:131-33:134/33:136-33:137, B*07:02:40, B*08:01:07, B*15:02:07, B*55:02:10 | -, A33(19), Null, B8 | 470 bp |
| E3 | E6 | E9 | E12 | Mix 20 | A*03:01:39, A*29:19/29:39/29:48, A*68:01:28/68:130:02, A*74:01:01-74:09/74:11-74:15/74:16:02-74:28 | -, A74(19), Null | 160 bp |
| D3 | D6 | D9 | D12 | Mix 21 | A*02:01:09/02:05:05/02:06:07/02:11:02/02:35:03/02:50/02:76:02/02:122/02:243:02/02:528:02/02:570/02:591:01, A*03:171/03:271, A*11:57/11:158, A*24:94/24:138/24:188/24:228/24:293, A*29:51/29:69/29:73, A*68:01:01-68:01:10/68:01:12-68:01:24/68:01:26-68:02:06/68:02:08-68:47/68:51-68:128/68:130:01-68:136/68:138-68:174, A*69:01:01-69:03 | A2, -, A68(28), A28, Null, A69(28) | 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*03:241, A*69:01:01-69:03 | A2, -, A69(28) | 390 bp |

| Position | | | | Mix | Allele | Serology | Size |
|----------|----|----|-----|--------|---|--|-----------|
| | | | | Mix 23 | A*02:01:01:01-02:01:08/02:01:10-02:01:11/02:01:12w/02:01:13-02:01:15/02:01:17-02:01:19/02:01:21-02:01:32/02:01:33w/02:01:34-02:01:39/02:01:41-02:01:81/02:01:83-02:05:04/02:05:06-02:06:06/02:06:08-02:11:01/02:11:03-02:22:02/02:24:01-02:35:01/02:35:02w/02:36-02:76:01/02:77/02:79:01-02:97:02/02:99/02:101:01-02:121/02:123-02:140/02:142-02:243:01/02:244-02:311/02:313-02:469/02:471-02:528:01/02:529-02:569/02:571-02:590/02:591:02-02:635/02:636w/02:637-02:643N/02:645-02:673/02:674w/02:675N-02:706, A*03:89:01, A*24:02:06/24:340, A*30:07w/30:13w/30:16w/30:22w/30:44w/30:46w, B*51:01:34w, C*07:02:27w/07:577w | A2, Low A2, -, A203, A210, Null, A2/19, A24(9) | see below |
| | | | | | A*02:556, B*51:01:34w | - | 175 bp |
| | | | | | A*02:50/02:556 | A2, - | 205 bp |
| | | | | | A*02:50/02:556 | A2, - | 225 bp |
| B3 | B6 | B9 | B12 | Mix 23 | A*02:01:01:01-02:01:08/02:01:10-02:01:11/02:01:12w/02:01:13-02:01:15/02:01:18-02:01:19/02:01:21-02:01:32/02:01:33w/02:01:34-02:01:39/02:01:41-02:01:50/02:01:53-02:01:62/02:01:64-02:01:73/02:01:75-02:01:76/02:01:78-02:01:81/02:01:83-02:01:113/02:01:115-02:05:02/02:05:04/02:05:06-02:06:06/02:06:08-02:06:11/02:06:13/02:06:15-02:06:19/02:06:21-02:11:01/02:11:03/02:11:05-02:11:08/02:12-02:22:01:02/02:24:01-02:35:01/02:36-02:44/02:47/02:49/02:51-02:54/02:57-02:60:02/02:62-02:76:01/02:77/02:79:01-02:91/02:93:01-02:97:02/02:99/02:101:01-02:102/02:104-02:112/02:114-02:121/02:123-02:128/02:130-02:140/02:142/02:145-02:168/02:170-02:175/02:177-02:184/02:186-02:194/02:196-02:200/02:202-02:204/02:207-02:216/02:218-02:243:01/02:244-02:248/02:250N-02:311/02:313-02:314N/02:316-02:320/02:322-02:357/02:359-02:368/02:370-02:371/02:373N-02:377/02:379-02:409/02:411-02:418/02:420-02:469/02:471-02:481/02:483-02:503/02:505-02:513/02:515-02:528:01/02:529-02:543/02:545-02:569/02:572-02:590/02:591:02-02:600/02:602-02:635/02:636w/02:637-02:643N/02:645-02:673/02:674w/02:675N-02:696N/02:698-02:706, A*03:89:01, A*30:22w, B*51:01:34w, C*07:02:27w/07:577w | A2, Low A2, -, A203, A210, Null, A2/19 | 135 bp |
| | | | | | A*02:01:01:01-02:01:08/02:01:10-02:01:11/02:01:12w/02:01:13-02:01:15/02:01:17-02:01:19/02:01:21-02:01:30/02:01:32/02:01:33w/02:01:34-02:01:39/02:01:41-02:01:66/02:01:68-02:01:81/02:01:83-02:01:121/02:01:123-02:01:126/02:01:128-02:05:04/02:05:06-02:06:06/02:06:08-02:07:05/02:07:07-02:07:11/02:09-02:11:01/02:11:03-02:19/02:21-02:22:02/02:24:01-02:33/02:35:02w/02:36-02:49/02:51-02:54/02:57-02:61/02:63-02:76:01/02:77/02:79:01-02:97:02/02:99/02:101:01-02:102/02:104-02:121/02:123-02:127/02:129-02:138/02:140/02:142-02:157:02/02:159-02:168/02:170-02:194/02:196-02:207/02:210-02:243:01/02:244-02:249/02:251-02:257/02:259-02:271/02:273-02:291/02:293Q-02:311/02:313-02:316/02:318-02:350N/02:352-02:385/02:387-02:414/02:416-02:469/02:472-02:492/02:494-02:528:01/02:529-02:569/02:571-02:579/02:581-02:584/02:586-02:590/02:591:02-02:608N/02:610:01-02:633/02:635/02:636w/02:637-02:643N/02:645-02:662/02:664-02:673/02:674w/02:675N-02:676/02:678-02:701/02:703-02:706, A*03:89:01, A*24:02:06/24:340, A*30:07w/30:22w | A2, Low A2, -, A203, A210, Null, A2/19, A24(9) | 165 bp |

| Position | | | | Mix | Allele | Serology | Size |
|----------|----|----|-----|--------|--|--|------------------|
| | | | | | 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/ 02:01:21-02:01:32/02:01:33w/02:01:34-02:01:39/02:01:41-02:01:48/02:01:50-02:01:81/02:01:83-02:01:107/ 02:01:109-02:05:04/02:05:06-02:06:01:04/02:06:03-02:06:06/02:06:08-02:10/02:12-02:22:02/02:24:01-02:34/02:36- 02:47/02:49/02:51-02:68/02:70-02:76:01/02:77/02:79:01-02:80/02:82N-02:86:02/02:88N-02:89/02:91-02:97:02/ 02:99/02:101:01-02:111/02:113:01N-02:115/02:117-02:121/02:123/02:125N-02:127/02:130-02:135/02:137-02:140/ 02:142-02:145/02:147-02:183/02:185-02:243:01/02:244-02:246/02:248-02:260/02:262-02:296/02:299-02:307/02:309- 02:311/02:313-02:330/02:332-02:365/02:367-02:380/02:382-02:393/02:395N-02:442/02:444-02:456/02:458-02:469/ 02:471-02:489/02:491-02:493/02:495-02:496/02:498-02:502/02:504-02:513/02:516N-02:528:01/02:529-02:533/ 02:535-02:569/02:572-02:576/02:578/02:581-02:583/02:585-02:588/02:590/02:591:02-02:626/02:628-02:635/ 02:636w/02:637-02:643N/02:646-02:673/02:674w/02:675N-02:700/02:702-02:704/02:706, A*03:89:01, A*30:13w/ 30:16w/30:44w/30:46w | A2, Low A2, -, A203, A210, Null, A2/19 | 190 bp |
| A3 | A6 | A9 | A12 | Mix 24 | A*43:01, A*80:01:01:01-80:01:01:02/80:03 | A43, A80, - | see below |
| | | | | | A*80:01:01:01-80:01:01:02/80:03 | A80, - | 170 bp |
| | | | | | A*43:01 | A43 | 445 bp |

Amplification control (internal positive control): 90 base pairs (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 several groups in the subsequent rows depending on the fragment size)

Table 2: Amplification patterns for all detectable HLA-A* specificities (Lot-No A16-2) based on IMGT/HLA Sequence Database Release 3.31.0, January 2018

| 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*01:01:01:01:01:01:55/01:01:57-01:01:64/01:01:67-01:04N/01:06-01:12/01:14-01:33/01:35-01:37/01:39-01:50/01:52:01N-01:71/01:73-01:101/01:103-01:138/01:140-01:166/01:168-01:175/01:177-01:193/01:195-01:199/01:201-01:220/01:222-01:243, A*11:94, B*07:64, B*15:12/15:19/15:270/15:298/15:304N | A1, Null, -, B76(15) | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| A*01:01:56 | - | 1 | | | | | | | | | 10 | | | | | | | | | | | | | | |
| A*01:13/01:176/01:194 | - | 1 | | 4 | | | | | | | | | | | | | | | | | | | | | |
| A*01:51 | - | 1 | | | | | | | | | | | 13 | | | | | | | | | | | | |
| A*01:200/01:244, A*11:17, A*36:01/36:03-36:05 | -, A36 | | 2 | | | | | | | | | | | | | | | | | | | | | | |
| A*02:01:01:01:02:01:08/02:01:10-02:01:11/02:01:13-02:01:15/02:01:18-02:01:19/02:01:21-02:01:25/02:01:27-02:01:32/02:01:34-02:01:39/02:01:41-02:01:51/02:01:53-02:01:63/02:01:66-02:01:68/02:01:70-02:01:73/02:01:75-02:01:80/02:01:83-02:01:94/02:01:96-02:03:06/02:03:08-02:05:02/02:05:04/02:05:06-02:06:06/02:06:08-02:06:11/02:06:13-02:06:18/02:06:20-02:11:01/02:11:03-02:11:06/02:11:08-02:11:09/02:14-02:16/02:18/02:20:01-02:22:02/02:24:01/02:25-02:26/02:28-02:33/02:36/02:39-02:43N/02:45/02:47/02:51/02:53N/02:57-02:61/02:63/02:66-02:69/02:71/02:73-02:76:01/02:77/02:79:01-02:79:02/02:81-02:87/02:89-02:97:02/02:99/02:101:01-02:102/02:104/02:106-02:107/02:109/02:111-02:113:02N/02:115-02:116/02:118/02:120-02:121/02:123-02:128/02:130-02:134/02:136-02:140/02:143-02:151/02:153:01-02:168/02:170-02:177/02:179-02:184/02:186-02:187/02:189-02:192/02:194/02:196-02:222N/02:224-02:225N/02:227N-02:228/02:230-02:243:01/02:244-02:245/02:247-02:267/02:269-02:270/02:272/02:274/02:276-02:278/02:281-02:285/02:287/02:289:01/02:290-02:297/02:299/02:302/02:305N-02:307/02:310/02:313-02:327/02:329-02:338/02:340-02:347/02:349-02:376/02:378-02:382/02:384-02:405/02:407-02:411/02:413-02:416/02:418-02:453/02:455-02:469/02:471-02:487/02:489-02:490N/02:492-02:503/02:505-02:506N/02:508-02:509/02:511-02:526/02:528:01/02:529-02:542/02:544-02:569/02:572-02:581/02:583-02:590/02:591:02-02:600/02:602-02:608N/02:610:01-02:616/02:618Q-02:621/02:623-02:629/02:631-02:635/02:637-02:640/02:642/02:645-02:656/02:658-02:661/02:663-02:673/02:675N/02:677/02:679/02:684-02:706 | A2, Low A2, -, A203, A210, Null | | | 3 | | | | | | | | | | | | | | | | | | | | | 23 |
| A*02:01:09/02:05:05/02:06:07/02:11:02/02:76:02/02:243:02/02:528:02/02:570 | A2, - | | | 3 | | | | | | | | | | | | | | | | | | 21 | | | |
| A*02:01:12/02:01:33/02:636/02:674 | A2, - | | | 3 | | | | | | | | | | | | | | | | | | | | w | |

| 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*02:01:17/02:01:26/02:01:52/02:01:64/02:01:74/02:01:81/02:03:07/ 02:05:03/02:06:12/02:55/02:64:01-02:64:02/02:72/02:80/02:88N/02:114/ 02:117/02:119/02:169/02:178/02:185/02:188/02:195/02:223N/02:229/ 02:246/02:275/02:279/02:288/02:289:02/02:298/02:301N/02:304/02:339/ 02:348/02:377/02:383/02:406/02:412/02:491/02:504/02:510/02:527/ 02:582/02:601/02:641/02:643N/02:676/02:678/02:681 | A2, -, Null | | | | | | | | | | | | | | | | | | | | | | | 23 | |
| A*02:01:40/02:141/02:312/02:470 | A2, - | | | 3 | | | | | | | | | | | | | | | | | | | | | |
| A*02:01:65/02:01:69/02:01:95/02:06:19/02:11:07/02:105/02:193/02:273/ 02:286/02:308/02:311/02:328/02:488/02:622N | -, A2, Null | | | w | | | | | | | | | | | | | | | | | | | | 23 | |
| A*02:12-02:13/02:19/02:27/02:37-02:38/02:44/02:49/02:54/02:142/ 02:226N/02:271/02:280/02:417/02:543/02:630/02:682-02:683 | A2, -, Null | | | 3 | | | | | | | | | | | 14 | | | | | | | | | 23 | |
| A*02:17:01-02:17:04/02:108/02:110/02:300/02:303/02:617/02:657/02:680 | A2, - | | | 3 | | | | | | | 11 | | | | | | | | | | | | | 23 | |
| A*02:24:02/02:507 | - | | | 3 | | | | | | | | | | | | | | | 19 | | | | | 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 | |
| A*02:48/02:129/02:571 | - | | | | | | 6 | | | | | | | | | | | | | | | | | 23 | |
| A*02:50 | A2 | | | | | | | | | | | | | | | | | | | | | 21 | 23 | | |
| A*02:52 | - | | | | | | | | 8 | | | | | | | | | | | | | | | 23 | |
| A*02:56:02/02:103 | - | | | | | | | | | | | | | | | | | | | | | | 22 | 23 | |
| A*02:65/02:152 | A2/19, - | | | | | | | | | | | | | | | | | | | 19 | | | | 23 | |
| A*02:78 | A2 | | | 3 | | | | | | | | | | | | | | | | | | | 22 | | |
| A*02:122/02:591:01, A*11:158, A*68:01:01:01-68:01:10/68:01:12-68:01:24/ 68:01:26-68:01:27/68:01:29-68:02:06/68:02:08-68:08:02/68:10-68:25/ 68:27:01-68:27:02/68:29-68:47/68:51-68:70/68:72-68:102/68:104:01- 68:128/68:130:01/68:131-68:133/68:135-68:136/68:138-68:174 | -, A68(28), A28, Null | | | | | | | | | | | | | | | | | | | | | 21 | | | |
| A*02:135/02:309/02:454 | - | | | | | | | | 8 | 9 | 10 | | | | | | | | | | | | | 23 | |
| A*02:268 | - | | | 3 | | | | | | | | w | | | | | | | | | | | | 23 | |
| A*02:609 | - | | w | 3 | | | | | | | | | | | | | | | | | | | | 23 | |
| A*02:662 | - | | | | | | | | | | | | | | 14 | | | | | | | | | 23 | |

| 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*03:01:01:01-03:01:38/03:01:40-03:01:64/03:03N-03:09/03:11N-03:23:02/03:25-03:29/03:33-03:64/03:66-03:68N/03:70-03:72/03:74-03:75/03:77-03:81/03:83-03:88/03:89:02/03:91N-03:102/03:104-03:105/03:108-03:112/03:114-03:151/03:153-03:159/03:161N-03:163/03:165-03:166/03:168N-03:170/03:172-03:193/03:195-03:197N/03:199/03:201-03:217/03:220-03:222/03:224/03:226-03:235/03:238-03:240/03:243/03:245-03:252/03:254-03:259/03:261-03:270/03:272/03:276-03:280:02/03:283N-03:284N/03:286N-03:289 | A3, Null, - | | | | 4 | | | | | | | | | | | | | | | | | | | | | |
| A*03:01:39 | - | | | | 4 | | | | | | | | | | | 15 | | | | | 20 | | | | | |
| A*03:02:01-03:02:04/03:31-03:32/03:65/03:69N/03:73/03:76/03:82/03:90/03:106/03:113/03:160/03:198/03:218/03:223/03:236-03:237/03:242/03:244/03:253/03:274-03:275N/03:281/03:285, A*11:130 | A3, -, Null | | | | 4 | | | | | | | | | | w | | | | | | | | | | | |
| A*03:10/03:167/03:225, A*11:199:01/11:222 | - | | | | 4 | | | | | | | | | | 14 | | | | | | | | | | | |
| A*03:24 | A3 | | | | 4 | | | | | | | | 13 | | | | | | | | | | | | | |
| A*03:30/03:273 | - | | | | 4 | | 6 | | | | | | | | | | | | | | | | | | | |
| A*03:89:01 | - | | | | 4 | | | | | | | | | | | | | | | | | | | 23 | | |
| A*03:103:01-03:103:02/03:282 | - | | | | 4 | | | | | | | | 12 | | | | | | | | | | | | | |
| A*03:107/03:164, A*36:02 | - | | 2 | | 4 | | | | | | | | | | | | | | | | | | | | | |
| A*03:152 | - | | | | 4 | | 6 | | | | | | | | | | | | 18 | | | | | | | |
| A*03:171/03:271, A*68:71 | - | | | | 4 | | | | | | | | | | | | | | | | | 21 | | | | |
| A*03:219, A*32:04/32:52 | - | | | | 4 | | | | | | | | | | | | | | 18 | | | | | | | |
| A*03:241 | - | | | | 4 | | | | | | | | | | | | | | | | | | 22 | | | |
| A*11:01:01:01-11:01:34/11:01:36-11:01:56/11:01:58-11:09/11:11-11:16/11:18-11:22/11:26/11:29-11:30/11:32:01-11:34/11:36-11:37/11:41-11:44/11:46-11:49/11:51-11:52Q/11:54-11:56/11:58-11:77/11:79-11:93/11:95-11:97/11:99N-11:110/11:113-11:115N/11:117-11:129/11:131-11:138/11:141-11:157/11:159-11:175/11:177/11:179-11:182Q/11:184-11:189/11:192-11:198/11:199:02-11:208N/11:210N/11:212-11:221/11:224-11:225/11:227-11:228/11:230-11:249/11:251N-11:257/11:259-11:268, A*24:89/24:290, A*68:129 | A11, -, Null | | | | | | | | | | | | | | 14 | | | | | | | | | | | |
| A*11:10 | A11 | | | | | | | | | | | | 13 | 14 | | | | | | | | | | | | |
| A*11:23/11:98/11:229/11:250/11:258, A*33:19 | - | | | | | | | | | | | | | | w | | | | | | | | | | | |
| A*11:27/11:38-11:39/11:209 | - | 1 | | | | | | | | | | | | | 14 | | | | | | | | | | | |
| A*11:57, A*68:09/68:26/68:28/68:134 | -, A28 | | | | | | | | | | | | | | 14 | | | | | | | 21 | | | | |

| 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*11:116/11:140 | - | | | | | | | | | | | | 12 | 14 | | | | | | | | | | | |
| A*11:139 | - | | | | | | | | | | | 11 | | 14 | | | | | | | | | | | |
| A*11:178/11:190, A*24:02:17/24:02:49/24:02:89/24:08/24:21:01-24:21:02/ 24:29/24:31/24:42/24:67/24:77/24:156/24:158N/24:191/24:200/24:237/ 24:273/24:309-24:310:01/24:326/24:342/24:359N/24:370N/24:389N, B*51:55 | -, A24(9), Null | | | | | | | 7 | | | | | | | | | | | | | | | | | |
| A*23:01:01:01-23:02/23:05-23:08N/23:10-23:22/23:25-23:27/23:29-23:30/ 23:32-23:33/23:35-23:36/23:38N-23:44/23:46-23:50/23:52-23:54/23:56/ 23:58-23:60/23:62-23:65/23:67-23:68/23:70-23:79/23:81-23:82 | A23(9), -, Null | | | | | 5 | 6 | | | | | | | | | | | | | | | | | | |
| A*23:03:01 | - | | | | | 5 | | | | | | | | | | | | | 18 | | | | | | |
| A*23:03:02/23:09/23:23/23:28/23:37:01-23:37:02/23:51/23:61/23:80, A*24:24/24:392 | - | | | | | 5 | | | | | | | | | | | | | | | | | | | |
| A*23:04, A*24:315 | A23(9), - | | | | | 5 | 6 | | | | | 11 | | | | | | | | | | | | | |
| A*23:24/23:34/23:57/23:66, A*24:02:74/24:04/24:06/24:13:01-24:13:02/ 24:87/24:107/24:109/24:227/24:285/24:355/24:373/24:381, A*33:21/33:53 | -, A24(9) | | | | | | 6 | | | | | | | | | | | | | | | | | | |
| A*23:31/23:45/23:55 | - | 1 | | | | 5 | 6 | | | | | | | | | | | | | | | | | | |
| A*23:83 | - | | | | | 5 | | | | | | 11 | | | | | | | 18 | | | | | | |
| A*24:02:01:01-24:02:05/24:02:07-24:02:16/24:02:18-24:02:48/24:02:50- 24:02:63/24:02:65/24:02:67-24:02:73/24:02:75/24:02:77-24:02:88/24:02:90- 24:02:103/24:05:01-24:05:02/24:07:01-24:07:02/24:09N/24:11N/ 24:14:01:01-24:14:01:03/24:17/24:20:01:01-24:20:01:02/24:23/24:25-24:27/ 24:30/24:32/24:34-24:40N/24:43/24:45N-24:50/24:52-24:64/24:66/24:68- 24:70/24:72-24:76/24:78-24:86N/24:88/24:90:01N-24:91/24:93/24:95- 24:106/24:108/24:110-24:124/24:126-24:128/24:130-24:137/24:139- 24:155N/24:157/24:159-24:166/24:168-24:187/24:189-24:190/24:192- 24:199/24:201-24:203/24:205-24:206/24:209/24:212/24:214-24:226:02/ 24:229-24:234/24:236/24:238-24:272/24:274-24:277/24:279-24:284/24:286- 24:288/24:291-24:292/24:294Q-24:298/24:301-24:308/24:311-24:314/ 24:316-24:325/24:327-24:338/24:341/24:344-24:354/24:356-24:358/24:360- 24:369/24:371-24:372/24:375-24:378/24:380/24:382-24:386/24:388N/ 24:390-24:391/24:393-24:394 | A24(9), Low A24(9), -, A9, Null, A2403 | | | | | | 6 | 7 | | | | | | | | | | | | | | | | | |
| A*24:02:06 | A24(9) | | | | | | 6 | 7 | | | | | | | | | | | | | | | | 23 | |
| A*24:02:64/24:02:66/24:343 | - | | | | | | w | 7 | | | | | | | | | | | | | | | | | |
| A*24:02:76 | - | | | 3 | | | 6 | 7 | | | | | | | | | | | | | | | | | |

| 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*24:03:01:01-24:03:04/24:10:01-24:10:02/24:33/24:125/24:210/24:300/24:374/24:387 | A2403, - | | | | | | 6 | 7 | | | | 11 | | | | | | | | | | | | | |
| A*24:15/24:41/24:51/24:92/24:235 | - | 1 | | | | | 6 | 7 | | | | | | | | | | | | | | | | | |
| A*24:18 | A24(9)/A3 | | | | | | 6 | | | | | 11 | | | | | | | 18 | | | | | | |
| A*24:19/24:28/24:44/24:379 | A9, A24(9), - | | | | | | 6 | | | | | | | 14 | | | | | | | | | | | |
| A*24:21:03, A*32:02/32:22 | -, A32(19) | | | | | | | 7 | | | | | | | | | | | 18 | | | | | | |
| A*24:22/24:167/24:207:01-24:207:02/24:289/24:299/24:339 | A9, - | | | | | | 6 | | | | | 11 | | | | | | | | | | | | | |
| A*24:71 | - | | | | | 5 | 6 | 7 | | | | | | | | | | | | | | | | | |
| A*24:94/24:138 | - | | | | | | 6 | | | | | 11 | | | | | | | | | | 21 | | | |
| A*24:188/24:228 | - | | | | | | 6 | | | | | | | | | | | | | | | 21 | | | |
| A*24:204 | - | | | | | | 6 | 7 | | | | 11 | | | | | | | 18 | | | | | | |
| A*24:208/24:213 | - | | | | | | 6 | 7 | | | | | | | | | | | 18 | | | | | | |
| A*24:278N | Null | | | | | | 6 | w | | | | | | | | | | | | | | | | | |
| A*24:293 | - | | | | | | 6 | 7 | | | | | | | | | | | | | | 21 | | | |
| A*24:310:02 | - | | | 3 | | | | 7 | | | | | | | | | | | | | | | | | |
| A*24:340 | - | | | | | | 6 | 7 | | | | 11 | | | | | | | | | | | | 23 | |
| A*25:01:01:01-25:01:01:02/25:01:03-25:01:07/25:01:10-25:01:12/25:03/25:05-25:10/25:12N-25:13/25:15-25:23/25:25-25:32/25:34-25:35/25:37-25:38/25:40-25:42N/25:45-25:46 | A25(10), -, Null | | | | | | | | 8 | 9 | | | | | | | | | | | | | | | |
| A*25:01:02 | A25(10) | | | | | | | | w | 9 | | | | | | | | | | | | | | | |
| A*25:01:08/25:39 | - | | | | | | | | 8 | w | | | | | | | | | | | | | | | |
| A*25:02 | A25(10) | | | | | | | | 8 | 9 | | | 12 | | | | | | | | | | | | |
| A*25:04/25:44 | - | | | | | | | 7 | 8 | 9 | | | | | | | | | | | | | | | |
| A*25:11 | - | | | | | | | | w | 9 | 10 | | | | | | | | | | | | | | |
| A*25:14, A*30:12/30:18/30:41, A*32:101Q, C*04:01:49 | -, A30(19) | | | | | | | | 8 | | | | | | | | | | | | | | | | |
| A*25:24/25:33, A*26:01:02/26:01:13/26:110, A*66:03:01:01-66:03:01:02/66:05/66:15/66:28N, B*38:02:04 | -, A26(10), A10, Null | | | | | | | | | 9 | | | | | | | | | | | | | | | |
| A*25:36 | - | 1 | | | | | | | 8 | 9 | | | | | | | | | | | | | | | |
| A*25:43 | - | | | | | | | | | | | | | 13 | | | | | | | | | | | |

| 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*26:01:01:01-26:01:01:09/26:01:03-26:01:12/26:01:14-26:01:26/26:01:28-26:01:37/26:01:39-26:12/26:14-26:18/26:20-26:28/26:30/26:32/26:34-26:43:02/26:45-26:47/26:50-26:59/26:61-26:68/26:70-26:71N/26:73-26:75/26:77-26:83/26:86-26:109/26:111-26:124/26:126-26:130/26:132-26:142/26:145N-26:149 | A26(10), -, Null, A10 | | | | | | | | | 9 | 10 | | | | | | | | | | | | | | |
| A*26:01:27/26:31/26:84 | - | | | | | | | | | | 10 | | | | | | | | | | | | | | |
| A*26:01:38/26:76 | - | | | | | | | | | w | 10 | | | | | | | | | | | | | | |
| A*26:13 | - | | | | | | | | | 9 | 10 | | 12 | | | | | | | | | | | | |
| A*26:19 | - | | | | | | | | | | 10 | | 12 | | | | | | | | | | | | |
| A*26:29/26:49 | A26(10), - | 1 | | | | | | | | 9 | 10 | | | | | | | | | | | | | | |
| A*26:33, A*34:06, A*66:01:01:01-66:02/66:04/66:06-66:09/66:11-66:14/66:16-66:18/66:20-66:22/66:24-66:27N/66:29 | -, A66(10), Null | | | | | | | | | 9 | | | 12 | | | | | | | | | | | | |
| A*26:48/26:69 | - | | | | | | | | | 9 | 10 | 11 | | | | | | | | | | | | | |
| A*26:72 | - | | 2 | | | | | | | | 10 | | | | | | | | | | | | | | |
| A*26:143 | - | | | | | | | | | w | w | | | | | | | | | | | | | | |
| A*29:01:01:01-29:01:06/29:01:08-29:06/29:08N-29:12/29:15-29:18/29:20-29:31/29:33-29:38/29:40-29:47/29:50/29:52-29:59/29:61-29:68/29:70-29:72/29:74-29:104/29:106-29:110, A*32:30:02, A*74:10 | A29(19), Null, - | | | | | | | | | | | | | | | 15 | | | | | | | | | |
| A*29:07/29:49 | - | | | | 5 | | | | | | | 11 | | | | 15 | | | | | | | | | |
| A*29:13, A*32:30:01/32:32 | - | | | | | | | | | | | | | | | 15 | | 18 | | | | | | | |
| A*29:14 | - | | | | | | | | | | | | | | | 15 | | 17 | | | | | | | |
| A*29:19/29:39 | - | | | | | | | | | | | | | | | 15 | | | | | 20 | | | | |
| A*29:32 | - | | | | | | | | | | | | 12 | | | 15 | | | | | | | | | |
| A*29:48 | - | | | | | | | | | | | | | | | 15 | | | | 19 | 20 | | | | |
| A*29:51/29:69/29:73 | - | | | | | | | | | | | | | | | 15 | | | | | | 21 | | | |
| A*29:105 | - | | | | | | | | | | | | | | | 15 | | | | 19 | | | | | |
| A*29:111 | - | | | | | | | | | | | | | | | w | | | | | | | | | |
| A*30:01:01:01-30:01:07/30:01:09-30:02:09/30:02:11/30:02:13-30:04:01/30:06/30:08-30:11:02/30:14L-30:15/30:17/30:19-30:20/30:23-30:25/30:27N-30:40/30:42-30:43/30:45/30:47-30:54/30:56-30:81/30:83/30:85-30:88/30:91-30:95/30:97-30:99/30:02:12/30:101Q-30:123N/30:125-30:127 | A30(19), -, Null | | | | | | | | 8 | | | | | | | | 16 | | | | | | | | |
| A*30:01:08 | - | | | | | | | | 8 | | | | | | | w | | | | | | | | | |
| A*30:02:10 | - | | | | | | | | 8 | | 10 | | | | | | | | | | | | | | |

| 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*30:04:02/30:90/30:96/30:124 | - | | | | | | | | | | | | | | | | 16 | | | | | | | | |
| A*30:07/30:13/30:16/30:22/30:44/30:46 | - | | | | | | | | 8 | | | | | | | | 16 | | | | | | | w | |
| A*30:55 | - | | | | 4 | | | | 8 | | | | | | | | | | | | | | | | |
| A*30:89 | - | | | | 4 | | | | 8 | | | | | | | | 16 | | | | | | | | |
| A*31:01:02:01-31:01:06/31:01:08-31:06/31:09/31:11-31:20/31:23/31:25-31:28/31:30-31:74/31:76-31:88/31:91-31:96/31:98-31:103/31:105-31:108/31:110-31:114/31:116-31:133 | A31(19), -, Null | | | | | | | | | | | | | | | | | 17 | | | | | | | |
| A*31:07/31:10 | -, A31(19) | | | | | | | | | | | | | | | | | 17 | 18 | | | | | | |
| A*31:08, A*32:79 | - | | | | | | 6 | | | | | | | | | | | | 18 | | | | | | |
| A*31:24/31:97 | - | | | | | | | | | | | | | | w | | | 17 | | | | | | | |
| A*31:29 | - | | | | | 5 | | | | | | 11 | | | | | | 17 | | | | | | | |
| A*31:89, A*66:23 | - | | | | | | | | | | | | 12 | | | | | | | | | | | | |
| A*31:104 | - | | | | | | | | | | | | | | | | | w | | | | | | | |
| A*31:115 | - | | | | | | | | | | | | 12 | | | | | 17 | | | | | | | |
| A*32:01:01:01-32:01:06/32:01:08-32:01:11/32:01:13-32:01:28/32:03/32:05-32:12/32:14/32:16/32:18-32:21/32:23/32:25-32:27N/32:29/32:31/32:33:01/32:35-32:51/32:53-32:65/32:67-32:70/32:72-32:74/32:76-32:78/32:80-32:92N/32:95-32:100/32:102-32:107 | A32(19), -, Null | | | | | | | | | | | | | | | | | | 18 | | | | | | |
| A*32:13 | - | 1 | | | | | | | | | | | | | | | | | 18 | | | | | | |
| A*32:15/32:93 | - | | | | | | | | | | | | | | | | | | 18 | 19 | | | | | |
| A*32:17 | - | | | | w | | | | | | | | 12 | | | | | | 18 | | | | | | |
| A*32:24 | - | | 2 | | | | | | | | | | | | | | | | 18 | | | | | | |
| A*32:75/32:94 | - | | | | | | | | | | | | | | | | | | w | | | | | | |
| A*33:01:01:01-33:01:04/33:01:06-33:01:10/33:03:01:01-33:03:25/33:03:28-33:03:30/33:03:32-33:18:01/33:20/33:22-33:29/33:31/33:33-33:34/33:36-33:37/33:39-33:48/33:50-33:52/33:54-33:58/33:60-33:65/33:67-33:80N/33:82-33:88/33:90-33:101/33:103-33:121/33:123N-33:124/33:126-33:129N/33:132-33:134/33:136-33:137, B*07:02:40, B*08:01:07, B*15:02:07, B*55:02:10 | A33(19), -, A19, Null, B8 | | | | | | | | | | | | | | | | | | | 19 | | | | | |
| A*33:03:26/33:03:31/33:66 | - | | | | | | | | | | | | | | | | | | | w | | | | | |
| A*33:49 | - | | | | | | | | | | | | | 13 | | | | | | 19 | | | | | |
| A*33:59/33:102 | - | | | | | | | | | | | | | | w | | | | | 19 | | | | | |
| A*33:125/33:131 | - | | | | | | | | | | | | 12 | | | | | | | 19 | | | | | |

| 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*34:01:01-34:01:02/34:05/34:11/34:14/34:16-34:17 | A34(10), - | | | | | | | | | 9 | | 11 | 12 | | | | | | | | | | | | |
| A*34:02:01-34:04/34:07/34:09-34:10N/34:13/34:15 | A34(10), -, Null | | | | | | | | | 9 | | | 13 | | | | | | | | | | | | |
| A*34:08 | - | | | | 4 | | | | | 9 | | | 13 | | | | | | | | | | | | |
| A*34:12 | - | | | | | | | | | | | 11 | 12 | | | | | | | | | | | | |
| A*43:01 | A43 | | | | | | | | | | 10 | | | | | | | | | | | | | | 24 |
| A*66:10 | - | 1 | | | | | | | | 9 | | | 12 | | | | | | | | | | | | |
| A*66:19 | - | | | | | | | | | 9 | | | 12 | 14 | | | | | | | | | | | |
| A*68:01:28/68:130:02 | - | | | | | | | | | | | | | | | 15 | | | | | 20 | 21 | | | |
| A*68:103:01-68:103:02 | - | | | | | | | | | | | | 13 | | | | | | | | | 21 | | | |
| A*69:01:01:01-69:02 | A69(28), - | | | | | | | | | | | | | | | | | | | | | 21 | 22 | | |
| A*69:03 | - | | | | | | | | | | | | | | 14 | | | | | | | 21 | 22 | | |
| A*74:01:01-74:03/74:05-74:09/74:11-74:12N/74:14N-74:15/74:16:02-74:20/74:22-74:28 | A74(19), -, Null | | | | | | | | | | | | | | | | | | | | | 20 | | | |
| A*74:04/74:21 | - | | | | | | | | | | | | | | | | | | | 19 | 20 | | | | |
| A*74:13 | - | | | | 4 | | | | | | | | 12 | | | | | | | | | 20 | | | |
| A*80:01:01:01-80:01:01:02/80:03 | A80, - | | | | | | | | | | | | | | | | | | | | | | | | 24 |
| B*07:225/07:260 | - | | | | | | | | w | | | | | | | | | | | | | | | | |
| B*18:27 | - | | | | | 5 | | | | | | w | | | | | | | | | | | | | |
| B*51:01:34, 07:02:27/07:577 | - | | | | | | | | | | | | | | | | | | | | | | | w | |
| B*51:05 | B51(5) | | | | | | | w | | | | | | | | | | | | | | | | | |
| C*04:232 | - | | | | | | | | | | | 11 | | | | | | | | | | | | | |

w = weak,

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