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Product No.: 104 + 404
Lot No.: DR39-2

CTS Collaborative Transplant Study


WORKING INSTRUCTION

HLA-DRB1* CTS-PCR-SSP TRAY and BULK KITS

LOCUS- AND LOT-SPECIFIC MANUAL

To be applied to the following products:

| Product No. | Description |
|-------------|-------------------------------|
| 104 | HLA-DRB1 CTS-PCR-SSP BULK KIT |
| 404 | HLA-DRB1 CTS-PCR-SSP TRAY KIT |



Main differences between Lot DR39-2 (the current lot) and Lot DR 39-1:

- **Mix 1: The alleles amplified by this mix now result in only one PCR fragment (s. Table 1).**
- **An update with the IMGT/HLA Sequence Database of April 2011 was performed; therefore, the mix specificities have been extended by new alleles. Please also note the new HLA nomenclature.**

Introduction

- Intended use: This kit reveals a low/intermediate resolution typing of HLA-DRB1 (besides HLA-DRB3/4/5 low resolution) by the PCR-SSP method.
- Allele coverage IMGT/HLA Sequence Database Release 3.4.0, April 2011, except for: DRB1*01:18/01:22/01:33N, DRB1*09:09, DRB1*11:01:11/11:19:03/11:27:03/11:49:02/11:72-11:73/11:74:02/11:86/11:93-11:94, DRB1*12:20, DRB1*13:100, DRB1*14:113, DRB1*15:34, DRB1*16:18, DRB3*02:26-02:27 and DRB4*01:05. The alleles which are not covered are considered to be rare and can be detected by e. g. sequencing with the CTS-SEQUENCE Kit (you may contact us for further information).
- This manual is only valid for **Lot No. DR39-2**.
- This manual should be used together with the Main Manual (General Information) which is either the ‘Working Instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS’ (Manual No. 100A) or the ‘Working Instruction for the CTS-PCR-SSP BULK KITS’ (Manual No. 400A), depending on the type of the kit you received.

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1. Kit Composition

TRAY KIT

- Number of PCR primer mixes per test: 24 (23 allele-specific mixes and 1 negative control mix)
- 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 ml of 5% Mastermix (without Taq polymerase)

BULK KIT

- Number of PCR primer mixes per test: 24 (23 allele-specific mixes and 1 negative control mix)
- Number of tests per kit: at least 106
- The primer mixes are aliquoted in plastic tubes.
- PCR buffer: 7 ml of 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) or the ‘Working instruction for the CTS-PCR-SSP BULK KITS’ (Manual No. 400A) 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) or the ‘Working instruction for the CTS-PCR-SSP BULK KITS’ (Manual No. 400A) 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) or the ‘Working instruction for the CTS-PCR-SSP BULK KITS’ (Manual No. 400A) supplied along with this product.

4. Result Evaluation

- 4.1 Check the approximate size of the PCR product against the Primer Mix Specificity Table (Table 1) to confirm the correct product size.
- 4.2 Use the Amplification Pattern Table (Table 2) to make allele assignment. Alternatively, you can use the SCORE Software (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 refer to Section 7 of the 'Working instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS' (Manual No. 100A) or the 'Working instruction for the CTS-PCR-SSP BULK KITS' (Manual No. 400A) supplied along with this product

SPECIAL NOTES

Mix 5 may show a dimer formation. The allele-specific PCR amplicons can be clearly distinguished from the dimer band based on their fragment sizes.

Mix 6 and mix 7 detect (among other alleles) the most common HLA-DRB1*03 alleles which correspond either to serological split HLA-DR17 or HLA-DR18, respectively.

6. Troubleshooting

Please refer to Section 8 of the 'Working instruction for the CTS-PCR-SSP TRAY and MINITRAY KITS' (Manual No. 100A) or the 'Working instruction for the CTS-PCR-SSP BULK KITS' (Manual No. 400A) 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) or the Material Safety Data Sheet for the CTS-PCR-SSP BULK KITS (Manual No. 400B) 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(s), please do not hesitate to contact me or my coworkers at:

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Hien Tran, M.D.

Table 1: Sizes of the PCR products and allele specificities of each HLA-DRB1* CTS-PCR-SSP primer mix (Lot No. DR39-2) based on Allele coverage IMGT/HLA Sequence Database Release 3.4.0, April 2011

Amplification Control (Internal Positive Control): Product size 440 base pairs (bp)

| Position on Tray | | | | Mix | Amplified Alleles | Serology | Product Size (bp) |
|------------------|----|----|-----|------|--|---|-------------------|
| H1 | H4 | H7 | H10 | Mix1 | DRB1*01:01:01-01:17/01:19-01:21/01:23-01:32/01:34-01:36 | DR1, -, DR103/DR1 | 140 bp |
| G1 | G4 | G7 | G10 | Mix2 | DRB1*01:03 | DR103/DR1 | 200 bp |
| F1 | F4 | F7 | F10 | Mix3 | DRB1*15:01:01-01-15:33/15:35-15:57, DRB1*16:09-16:10 | DR15, -, DR2, Null, DR16 | see below |
| | | | | | DRB1*15:01:01-01-15:05/15:08/15:10/15:12-15:33/15:35-15:46/15:49-15:57, DRB1*16:09-16:10 | DR15, -, DR2, Null, DR16 | 140 bp |
| | | | | | DRB1*15:01:01-01-15:01:06/15:01:08-15:01:13/15:01:15-15:09/15:11-15:20/15:22-15:24/15:26/15:28-15:33/15:35-15:43/15:45/15:47-15:49/15:51-15:53/15:55-15:57 | DR15, -, DR2, Null | 215 bp |
| E1 | E4 | E7 | E10 | Mix4 | DRB1*08:04:02?, DRB1*15:21, DRB1*16:01:01-16:05:02/16:07-16:17 | DR8, DR2, DR16, -, Null | 210 bp |
| D1 | D4 | D7 | D10 | Mix5 | DRB1*03:01:01-01-03:01:03/03:01:05-03:41/03:43-03:49/03:52-03:54/03:56-03:64, DRB1*11:07/11:53/11:103/11:107, DRB3*01:14 | DR17, -, DR18, DR3, DR11 | 225 bp |
| C1 | C4 | C7 | C10 | Mix6 | DRB1*03:01:01-01-03:01:10/03:01:12/03:04:01-03:04:02/03:06/03:08/03:10-03:11:02/03:12?/03:13:01-03:13:02/03:15/03:16?/03:18-03:20/03:22-03:23/03:25-03:26/03:28/03:30-03:34/03:36-03:37/03:39/03:42-03:44/03:46-03:48/03:50-03:52/03:55-03:56/03:58-03:62/03:64, DRB1*09:06, DRB1*11:59/11:83, DRB1*13:27/13:71, DRB1*14:82/14:95 | DR17, -, DR3, DR9, DR11, DR13 | 220 bp |
| B1 | B4 | B7 | B10 | Mix7 | DRB1*03:02:01-03:02:02/03:05:01-03:05:03/03:09/03:14/03:27/03:29/03:38/03:53, DRB1*11:09/11:20/11:87, DRB1*13:02:01-13:02:03/13:02:05/13:05:01-13:05:02/13:26/13:29/13:31/13:34/13:36/13:39/13:41/13:50:02/13:56/13:63/13:65/13:67/13:73-13:74/13:85/13:96/13:99/13:103-13:104, DRB1*14:02-14:03:02/14:09/14:13/14:19?/14:24/14:27/14:30/14:46-14:48/14:51/14:63/14:67/14:85/14:89/14:98/14:109, DRB1*16:08, DRB3*01:08, DRB3*02:06?/02:20 | DR18, DR3, -, DR11, DR13, DR14, DR6, DR1403/DR14, DR16, Undefined, DR52 | 190 bp |
| A1 | A4 | A7 | A10 | Mix8 | DRB1*03:49, DRB1*04:01:01-04:98, DRB1*08:04:02?/08:38, DRB1*11:22/11:102, DRB1*14:10/14:57, DRB4*01:02? | -, DR4, DR4/DR3, Null, DR8, Undefined, DR14, DR4/DR6 | see below |
| | | | | | DRB1*04:01:01-04:01:03/04:01:05-04:01:06/04:02:01-04:05:04/04:05:06-04:48/04:50-04:63/04:65/04:67-04:84/04:86-04:98, DRB1*08:04:02?, DRB1*11:22, DRB1*14:10/14:57, DRB4*01:02? | DR4, -, DR4/DR3, Null, DR8, DR14, DR4/DR6, Undefined | 145 bp |
| | | | | | DRB1*04:01:01-04:01:07/04:05:01-04:05:10/04:07:01-04:09/04:14/04:16-04:17:02/04:19-04:21/04:24/04:26/04:28-04:31/04:33-04:35/04:38/04:43/04:45/04:47-04:48/04:54/04:57/04:61-04:63/04:69/04:72:01-04:72:02/04:74-04:77/04:80-04:84/04:86-04:87/04:89-04:90/04:92/04:98, DRB1*11:22 | DR4, -, Null, Undefined | 260 bp |
| | | | | | DRB1*03:49, DRB1*04:01:01-04:01:03/04:01:05-04:01:06/04:02:01-04:05:04/04:05:06-04:62/04:64-04:98, DRB1*08:38, DRB1*11:102 | DR4, -, DR4/DR3, Null | 85 bp |
| | | | | | DRB1*04:01:01-04:01:07/04:05:01-04:05:10/04:07:01-04:09/04:14/04:16-04:17:02/04:19-04:21/04:24/04:26/04:28-04:31/04:33-04:35/04:38/04:43/04:45/04:47-04:48/04:54/04:57/04:61-04:62/04:64/04:66/04:69/04:72:01-04:72:02/04:74-04:77/04:80-04:84/04:86-04:87/04:89-04:90/04:92/04:98, DRB1*08:38 | DR4, -, Null | 200 bp |

| Position on Tray | | | | Mix | Amplified Alleles | Serology | Product Size (bp) |
|------------------|----|----|-----|-------|---|---|-------------------|
| H2 | H5 | H8 | H11 | Mix9 | DRB1*07:01:01:01-07:01:03/07:03-07:21 | DR7, Null, – | see below |
| | | | | | DRB1*07:01:01:01-07:01:03/07:03-07:05/07:08-07:11/07:14-07:21 | DR7, Null, – | 115 bp |
| | | | | | DRB1*07:01:01:01-07:01:03/07:03/07:05-07:10N/07:12-07:21 | DR7, Null, – | 190 bp |
| G2 | G5 | G8 | G11 | Mix10 | DRB1*08:01:01-08:19/08:21-08:30:02/08:32-08:45, DRB1*11:67, DRB1*12:16/12:22, DRB1*14:04/14:15/14:28/14:31/14:50/14:68/14:71/14:73/14:76/14:79/14:93/14:107 | DR8, –, Undefined, DR1404/DR14 | see below |
| | | | | | DRB1*08:01:01-08:01:05/08:03:02/08:05-08:06/08:08/08:10/08:12/08:14/08:16-08:18/08:22-08:23/08:26-08:27/08:29/08:32-08:33/08:35-08:40/08:43, DRB1*14:04/14:28/14:31/14:50/14:68/14:71/14:73/14:76/14:79/14:93/14:107 | DR8, Undefined, –, DR1404/DR14 | 165 bp |
| | | | | | DRB1*08:01:01-08:04:07/08:06-08:17/08:19/08:21-08:23/08:26-08:28/08:30:01-08:30:02/08:32-08:39/08:42/08:44-08:45, DRB1*11:67, DRB1*14:15 | DR8, –, Undefined | 215 bp |
| | | | | | DRB1*08:01:01-08:01:03/08:01:05-08:03:02/08:05/08:07-08:09/08:11/08:13-08:19/08:21/08:23-08:27/08:29-08:30:02/08:32-08:38/08:41, DRB1*12:16/12:22, DRB1*14:68/14:93 | DR8, Undefined, –, DR14 | 250 bp |
| F2 | F5 | F8 | F11 | Mix11 | DRB1*09:01:02-09:05/09:07-09:08/09:10-09:12 | DR9, – | 220 bp |
| E2 | E5 | E8 | E11 | Mix12 | DRB1*10:01:01-10:03, DRB4*01:03:01:02N? | DR10, –, Null | 205 bp |
| D2 | D5 | D8 | D11 | Mix13 | DRB1*03:08, DRB1*04:15/04:61, DRB1*08:31/08:41, DRB1*11:01:01-11:01:10/11:01:12-11:19:02/11:20-11:27:02/11:28:01-11:39/11:40?/11:41-11:49:01/11:50-11:70/11:74:01/11:75-11:85/11:87-11:92/11:95-11:108, DRB1*12:04, DRB1*14:11, DRB1*16:16, DRB3*02:18, DRB5*01:13 | DR3, DR4, DR8/DR11, –, DR11/DR13, DR14, Undefined, DR12 | 125 bp |
| C2 | C5 | C8 | C11 | Mix14 | DRB1*08:25/08:32, DRB1*12:01:01-12:19/12:21-12:27 | DR8, Undefined, DR12, –, Null | see below |
| | | | | | DRB1*08:32, DRB1*12:01:01-12:13/12:15-12:19/12:21-12:27 | Undefined, DR12, –, Null | 105 bp |
| | | | | | DRB1*08:25, DRB1*12:01:01/12:01:03-12:02:03/12:02:05-12:15/12:17-12:19/12:21/12:23-12:27 | DR8, DR12, –, Null | 210 bp |
| B2 | B5 | B8 | B11 | Mix15 | DRB1*11:09/11:16/11:20/11:40w/11:58:01/11:59w/11:83/11:87, DRB1*13:01:01-13:01:06/13:01:08-13:02:01/13:02:02w/13:02:03-13:02:05/13:05:01-13:06/13:10/13:15-13:16/13:18/13:26-13:28/13:31-13:32/13:34-13:36/13:39-13:42/13:50:02-13:51/13:53/13:59/13:61:01-13:61:02/13:63w/13:65/13:67/13:69/13:73-13:74/13:77w/13:79-13:80/13:85/13:87/13:91-13:93/13:96/13:98-13:99/13:102-13:105/13:109/13:112-13:113N, DRB1*14:27/14:63/14:67/14:78, DRB1*16:08 | DR11, DR11/DR13, –, DR14, DR6, Null, DR16 | 130 bp |
| A2 | A5 | A8 | A11 | Mix16 | DRB1*03:12, DRB1*11:03/11:11:01-11:11:02/11:36/11:40-11:41/11:51?/11:55/11:59/11:63/11:68/11:76/11:85, DRB1*13:03:01-13:04/13:12:01-13:13/13:20-13:21:02/13:24/13:29-13:30/13:32-13:33:03/13:38/13:43/13:48-13:49/13:54-13:55/13:58/13:63/13:65-13:66:02/13:71/13:75/13:78/13:81/13:88-13:90/13:93-13:95/13:101/13:108/13:111/13:115, DRB1*14:13/14:63/14:65/14:78/14:85 | DR3, DR11, –, DR13, DR13/DR11, Undefined, DR6, DR14 | see below |
| | | | | | DRB1*03:12, DRB1*13:03:01-13:04/13:12:01-13:13/13:21:01-13:21:02/13:30/13:32-13:33:03/13:38/13:48-13:49/13:55/13:58/13:65-13:66:02/13:75/13:81/13:88-13:90/13:93-13:95/13:101/13:108/13:115, DRB1*14:13/14:63/14:65/14:78/14:85 | DR3, DR13, –, DR13/DR11, Undefined, DR6, DR14 | 170 bp |
| | | | | | DRB1*03:12, DRB1*11:03/11:11:01-11:11:02/11:36/11:40-11:41/11:51?/11:55/11:59/11:63/11:68/11:76/11:85, DRB1*13:20-13:21:01/13:24/13:29/13:43/13:49/13:54-13:55/13:63/13:71/13:75/13:78/13:111, DRB1*14:13/14:65 | DR3, DR11, –, DR13, DR13/DR11, DR6, DR14, Undefined | 200 bp |
| H3 | H6 | H9 | H12 | Mix17 | DRB1*11:09/11:40w/11:58:01/11:59w/11:83/11:87, DRB1*13:05:01-13:05:02/13:18/13:26/13:42/13:50:02/13:63w, DRB1*14:27, DRB1*16:08 | DR11, –, DR13, DR14, DR6, DR16 | 130 bp |

| Position on Tray | | | | Mix | Amplified Alleles | Serology | Product Size (bp) |
|------------------|----|----|-----|-------|---|--|-------------------|
| G3 | G6 | G9 | G12 | Mix18 | DRB1*03:01:01:01-03:01:06/03:01:08/03:01:10-03:07/03:09-03:13:01/03:14-03:37/03:38w/03:39-03:41/03:43-03:45/03:47-03:49/03:51-03:58/03:60-03:63, DRB1*04:14?, DRB1*08:01:01-08:24/08:25w/08:26-08:30:02/08:32-08:33/08:34w/08:35-08:40/08:42-08:45, DRB1*11:31?/11:52?, DRB1*12:01:01w-12:01:02w/12:02:01w-12:02:04w/12:03:02w/12:05w-12:08w/12:09/12:10w-12:17w, DRB1*13:01:01-13:53/13:54w/13:55-13:66:02/13:68-13:76/13:77w/13:78-13:99/13:101-13:102/13:104-13:111/13:113N-13:116, DRB1*14:01:01-14:09/14:12:01-14:38/14:40-14:45/14:47/14:48w/14:49-14:56/14:58-14:60/14:62-14:65/14:67-14:100/14:102-14:108/14:110-14:112, DRB4*01:02? | DR17, -, DR18, DR3, DR4, DR8, undefined, DR11, DR12, DR13, DR13/DR11, DR14, DR6, Null, DR1403/DR14, DR1404/DR14, DR13/14 | see below |
| | | | | | DRB1*03:01:01:01-03:01:05/03:01:08/03:01:10-03:07/03:09-03:13:01/03:14-03:37/03:38w/03:39-03:41/03:43-03:45/03:47-03:49/03:51-03:58/03:60-03:63, DRB1*04:14?, DRB1*08:20, DRB1*13:01:01-13:16/13:18-13:53/13:54w/13:55-13:66:02/13:68-13:76/13:77w/13:78-13:99/13:101-13:102/13:104-13:111/13:113N-13:115, DRB1*14:01:01-14:01:03/14:02-14:03:02/14:05:01-14:06:02/14:07:01-14:07:02/14:09/14:12:01-14:14/14:16/14:23:01/14:23:03-14:27/14:29-14:30/14:32:01-14:33/14:35-14:38/14:40-14:45/14:47/14:48w/14:49/14:51/14:53-14:56/14:58-14:60/14:62-14:65/14:67/14:69-14:70/14:72/14:74-14:75/14:77-14:78/14:80-14:92N/14:94-14:100/14:102-14:106/14:108/14:110-14:112, DRB4*01:02? | DR17, -, DR18, DR3, DR4, undefined, DR13, DR13/DR11, DR13/14, DR14, DR6, Null, DR1403/DR14 | 175 bp |
| | | | | | DRB1*08:08/08:15/08:21 DRB1*14:04/14:28/14:31/14:50/14:68/14:71/14:73/14:76/14:79/14:93/14:107 | DR8, DR1404/DR14, - | 165 bp |
| | | | | | DRB1*03:01:06/03:13:01, DRB1*04:14?, DRB1*08:01:01-08:07/08:09-08:14/08:16-08:19/08:21-08:24/08:25w/08:26-08:30:02/08:32-08:33/08:34w/08:35-08:40/08:42-08:45, DRB1*11:31?/11:52?, DRB1*12:01:01w-12:01:02w/12:02:01w-12:02:04w/12:03:02w/12:05w-12:08w/12:09/12:10w-12:17w, DRB1*13:17/13:39/13:78-13:79, 13:116, DRB1*14:08/14:15/14:23:02/14:34/14:52/14:64/14:72, DRB4*01:02? | DR17, DR3, DR4, DR8, DR11, -, Undefined, DR12, DR13, DR14 | 170 bp |
| F3 | F6 | F9 | F12 | Mix19 | DRB1*03:10/03:11:01w, DRB1*08:08?/08:29, DRB1*11:17/11:52-11:54:02, DRB1*13:43/13:45?/13:76, DRB1*14:01:01-14:01:03/14:04-14:05:03/14:07:01-14:08/14:11/14:14/14:16/14:18/14:22-14:23:03/14:25-14:26/14:28/14:31-14:33/14:35-14:36/14:38-14:39/14:42-14:45/14:49-14:51/14:53-14:56/14:58-14:62/14:64/14:68-14:76/14:79/14:82/14:86-14:88/14:90-14:93/14:95-14:97/14:99/14:101/14:104-14:105/14:107/14:110-14:112 | DR3, DR8, DR14, DR11, DR13, DR1404/DR14, DR6, Undefined, DR13/14, -, Null | see below |
| | | | | | DRB1*03:10, DRB1*08:08?, DRB1*13:43/13:45?, DRB1*14:01:01-14:01:03/14:04/14:07:01-14:07:02/14:16/14:22/14:25-14:26/14:28/14:31-14:32:02/14:35/14:38-14:39/14:49-14:50/14:53-14:55/14:58/14:60-14:62/14:68-14:71/14:73-14:76/14:79/14:82/14:86-14:88/14:90/14:92N/14:93/14:97/14:99/14:104-14:105/14:107/14:110-14:112 | DR3, DR8, DR13, DR1404/DR14, DR6, DR13/14, -, Null | 175 bp |
| | | | | | DRB1*03:11:01w, DRB1*08:29, DRB1*11:17/11:52-11:54:02, DRB1*13:76, DRB1*14:01:01-14:01:03/14:04/14:05:01-14:05:03/14:07:01-14:08/14:11/14:14/14:18/14:23:01-14:23:03/14:26/14:28/14:33/14:35-14:36/14:38-14:39/14:42-14:45/14:50-14:51/14:54/14:56/14:58-14:62/14:64/14:68/14:70-14:73/14:75/14:82/14:86/14:88/14:90-14:92N/14:95-14:97/14:99/14:101/14:110/14:112 | DR3, DR8, DR1404/DR14, DR11, DR13, DR6, Undefined, -, Null | 225 bp |
| E3 | E6 | E9 | E12 | Mix20 | DRB1*11:09/11:28:02w/11:58:01w/11:83/11:87, DRB1*13:05:01-13:06/13:18/13:26/13:42/13:50:02w/13:56/13:77, DRB1*14:02-14:03:02/14:06:01-14:06:02/14:09/14:12:01-14:13/14:17-14:18/14:27/14:29-14:30/14:33/14:46-14:48/14:51-14:52/14:59/14:63-14:64/14:67/14:78/14:80-14:81/14:83/14:85/14:89/14:95/14:98w/14:106/14:108, DRB1*16:08w | DR11, -, DR13, DR14, DR6, DR1403/DR14, DR16 | see below |
| | | | | | DRB1*11:09/11:28:02w/11:58:01w/11:83/11:87, DRB1*13:05:01-13:06/13:26/13:42/13:50:02w/13:56/13:77, DRB1*14:02/14:06:01-14:06:02/14:09/14:13/14:17-14:18/14:29-14:30/14:33/14:46-14:48/14:51-14:52/14:59/14:64/14:80-14:81/14:83/14:85/14:89/14:95/14:98w/14:106/14:108, DRB1*16:08w | DR11, -, DR13, DR14, DR6, DR16 | 145 bp |
| | | | | | DRB1*13:18, DRB1*14:03:01-14:03:02/14:12:01-14:12:02/14:27/14:63/14:67/14:78/14:85/14:89/14:98w | DR13, DR1403/DR14, -, DR6 | 150 bp |

| Position on Tray | | | | Mix | Amplified Alleles | Serology | Product Size (bp) |
|------------------|----|----|-----|-------|---|-------------------------------|-------------------|
| D3 | D6 | D9 | D12 | Mix21 | DRB1*04:17:01?, DRB1*09:07, DRB4*01:02?, DRB5*01:01:01-01:14, DRB5*02:02-02:05 | DR4, -, Undefined, DR51, Null | see below |
| | | | | | DRB1*04:17:01?, DRB4*01:02?, DRB5*01:01:01-01:11/01:14, DRB5*01:13, DRB5*02:02-02:05 | DR4, Undefined, DR51, Null, - | 175 bp |
| | | | | | DRB1*09:07, DRB4*01:02?, DRB5*01:12 | -, Undefined | 210 bp |
| C3 | C6 | C9 | C12 | Mix22 | DRB1*03:42, DRB3*01:01:02:01-01:13/01:15, DRB3*02:01-02:25/02:28, DRB3*03:01:01-03:03 | -, DR52, Undefined | 215 bp |
| B3 | B6 | B9 | B12 | Mix23 | DRB4*01:01:01-01:04/01:05?/01:06-01:08, DRB4*02:01N, DRB4*03:01N | DR53, Undefined, Null, - | see below |
| | | | | | DRB4*01:01:01-01:04/01:05?/01:06-01:07, DRB4*02:01N | DR53, Undefined, Null, - | 215 bp |
| | | | | | DRB4*01:01:01-01:04/01:05?/01:06-01:08, DRB4*02:01N | DR53, Undefined, Null, - | 695 bp |
| | | | | | DRB4*01:01:01-01:04/01:05?/01:06-01:08, DRB4*02:01N, DRB4*03:01N | DR53, Undefined, Null, - | 250 bp |
| A3 | A6 | A9 | A12 | Mix24 | Negative Control | - | None (440bp) |

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 different groups in the subsequent rows depending on their fragment size)

Table 2: Amplification patterns of HLA-DRB1* and other HLA-DRB alleles detected by the HLA-DRB1* CTS-PCR-SSP primer mixes (Lot No. DR39-2) based on Allele coverage IMGT/HLA Sequence Database Release 3.4.0, April 2011

| Alleles | Serology | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|--|--------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DRB1*01:01:01-01:02:05/01:04-01:17/01:19-01:21/01:23-01:32/01:34-01:36 | DR1, - | 1 | | | | | | | | | | | | | | | | | | | | | | |
| DRB1*01:03 | DR103/DR1 | 1 | 2 | | | | | | | | | | | | | | | | | | | | | |
| DRB1*03:01:01:01-03:01:03/03:01:05-03:01:06/03:01:08/03:01:10/03:01:12/03:04:01-03:04:02/03:06/03:11:02/03:13:01/03:15/03:18-03:20/03:22-03:23/03:25-03:26/03:28/03:30-03:34/03:36-03:37/03:39/03:43-03:44/03:47-03:48/03:52/03:56/03:58/03:60-03:62 | DR17, -, DR3 | | | | | 5 | 6 | | | | | | | | | | | | 18 | | | | | |
| DRB1*03:01:04/03:51/03:55 | DR17, - | | | | | | 6 | | | | | | | | | | | | 18 | | | | | |
| DRB1*03:01:07/03:01:09/03:13:02/03:46/03:59/03:64 | DR17, -, DR3 | | | | | 5 | 6 | | | | | | | | | | | | | | | | | |
| DRB1*03:01:11/03:01:13/03:03/03:07/03:17/03:21/03:24/03:35/03:40-03:41/03:45/03:54/03:57/03:63 | -, DR18, DR3 | | | | | 5 | | | | | | | | | | | | | | 18 | | | | |
| DRB1*03:02:01-03:02:02/03:05:01-03:05:03/03:09/03:14/03:27/03:29/03:53 | DR18, DR3, - | | | | | 5 | | 7 | | | | | | | | | | | | 18 | | | | |
| DRB1*03:08 | DR3 | | | | | 5 | 6 | | | | | | | 13 | | | | | | | | | | |
| DRB1*03:10 | DR3 | | | | | 5 | 6 | | | | | | | | | | | | | 18 | 19 | | | |
| DRB1*03:11:01 | DR3 | | | | | 5 | 6 | | | | | | | | | | | | | 18 | w | | | |
| DRB1*03:12 | DR3 | | | | | 5 | ? | | | | | | | | | | 16 | | | 18 | | | | |
| DRB1*03:16 | DR3 | | | | | 5 | ? | | | | | | | | | | | | | 18 | | | | |
| DRB1*03:38 | - | | | | | 5 | | 7 | | | | | | | | | | | | w | | | | |
| DRB1*03:42 | - | | | | | | 6 | | | | | | | | | | | | | | | | 22 | |
| DRB1*03:49 | - | | | | | 5 | | | 8 | | | | | | | | | | | 18 | | | | |
| DRB1*03:50, DRB1*09:06 | -, DR9 | | | | | | 6 | | | | | | | | | | | | | | | | | |
| DRB1*04:01:01-04:13/04:16/04:17-02-04:60/04:62-04:98, DRB1*14:10/14:57 | DR4, -, DR4/DR3, Null, DR14, DR4/DR6 | | | | | | | | 8 | | | | | | | | | | | | | | | |
| DRB1*04:14 | DR4 | | | | | | | | 8 | | | | | | | | | | | ? | | | | |
| DRB1*04:15/04:61, DRB1*11:22/11:102 | DR4, Undefined, - | | | | | | | | 8 | | | | | 13 | | | | | | | | | | |
| DRB1*04:17:01 | DR4 | | | | | | | | 8 | | | | | | | | | | | | | ? | | |
| DRB1*07:01:01:01-07:01:03/07:03-07:21 | DR7, Null, - | | | | | | | | | 9 | | | | | | | | | | | | | | |
| DRB1*08:01:01-08:04:01/08:04:03-08:07/08:09-08:19/08:21-08:24/08:26-08:28/08:30-01-08:30:02/08:33/08:35-08:37/08:39-08:40/08:42-08:45, DRB1*14:15 | DR8, - | | | | | | | | | | 10 | | | | | | | | | 18 | | | | |
| DRB1*08:04:02 | DR8 | | | | ? | | | | ? | | 10 | | | | | | | | | 18 | | | | |
| DRB1*08:08 | DR8 | | | | | | | | | | 10 | | | | | | | | | 18 | ? | | | |
| DRB1*08:20, DRB1*13:01:07/13:07:01-13:09/13:11:01-13:11:02/13:14:01-13:14:03/13:17/13:19/13:22-13:23:02/13:25/13:37/13:44/13:46-13:47/13:50:01/13:52/13:57/13:60/13:62/13:64/13:68/13:70/13:72/13:82-13:84/13:86/13:97/13:106-13:107/13:110/13:114/13:116, DRB1*14:20-14:21/14:34/14:37/14:40-14:41/14:77/14:84/14:94/14:100/14:102-14:103 | undefined, -, DR13, DR11, DR6, DR14 | | | | | | | | | | | | | | | | | | | 18 | | | | |
| DRB1*08:25, DRB1*12:16 | DR8, - | | | | | | | | | | 10 | | | | 14 | | | | w | | | | | |
| DRB1*08:29, DRB1*14:04/14:28/14:31/14:50/14:68/14:71/14:73/14:76/14:79/14:93/14:107 | DR8, DR1404/DR14, - | | | | | | | | | | 10 | | | | | | | | | 18 | 19 | | | |

| Alleles | Serology | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DRB1*08:31, DRB1*11:01:01-11:01:10/11:01:12-11:02:02/11:04:01-11:06:02/11:08:01-11:08:02/11:10:01-11:10:02/11:12:01-11:15/11:18-11:19:02/11:21/11:23-11:27:02/11:28:01/11:29-11:30/11:32-11:35/11:37-11:39/11:42-11:49:01/11:50/11:56-11:57/11:58:02/11:60-11:62/11:64-11:66/11:69-11:70/11:74:01/11:75/11:77-11:82/11:84/11:88-11:92/11:95-11:101/11:104-11:106/11:108 | DR8/DR11, - | | | | | | | | | | | | | 13 | | | | | | | | | | |
| DRB1*08:32 | Undefined | | | | | | | | | | 10 | | | | 14 | | | | 18 | | | | | |
| DRB1*08:34 | - | | | | | | | | | | 10 | | | | | | | | w | | | | | |
| DRB1*08:38 | - | | | | | | | | 8 | | 10 | | | | | | | | 18 | | | | | |
| DRB1*08:41, DRB1*11:67 | - | | | | | | | | | | 10 | | | 13 | | | | | | | | | | |
| DRB1*09:01:02-09:05/09:08/09:10-09:12 | DR9, - | | | | | | | | | | | 11 | | | | | | | | | | | | |
| DRB1*09:07 | - | | | | | | | | | | | 11 | | | | | | | | | | 21 | | |
| DRB1*10:01:01-10:03 | DR10, - | | | | | | | | | | | | 12 | | | | | | | | | | | |
| DRB1*11:03/11:11:01-11:11:02/11:36/11:41/11:55/11:63/11:68/11:76/11:85 | DR11, - | | | | | | | | | | | | | 13 | | | 16 | | | | | | | |
| DRB1*11:07/11:103/11:107 | DR11, - | | | | | 5 | | | | | | | | 13 | | | | | | | | | | |
| DRB1*11:09/11:87 | DR11, - | | | | | | | 7 | | | | | | 13 | 15 | | 17 | | | | 20 | | | |
| DRB1*11:16 | DR11/DR13 | | | | | | | | | | | | | 13 | 15 | | | | | | | | | |
| DRB1*11:17/11:54:01-11:54:02, DRB1*14:11 | DR14, DR11 | | | | | | | | | | | | | 13 | | | | | | 19 | | | | |
| DRB1*11:20 | DR11 | | | | | | | 7 | | | | | | 13 | 15 | | | | | | | | | |
| DRB1*11:28:02 | DR11 | | | | | | | | | | | | | 13 | | | | | | | w | | | |
| DRB1*11:31 | DR11 | | | | | | | | | | | | | 13 | | | | | ? | | | | | |
| DRB1*11:40 | DR11 | | | | | | | | | | | | | ? | w | 16 | w | | | | | | | |
| DRB1*11:51 | DR11 | | | | | | | | | | | | | 13 | | ? | | | | | | | | |
| DRB1*11:52 | DR11 | | | | | | | | | | | | | 13 | | | | | ? | 19 | | | | |
| DRB1*11:53 | DR11 | | | | | 5 | | | | | | | | 13 | | | | | | 19 | | | | |
| DRB1*11:58:01 | DR11 | | | | | | | | | | | | | 13 | 15 | | 17 | | | | w | | | |
| DRB1*11:59 | DR11 | | | | | | | 6 | | | | | | 13 | w | 16 | w | | | | | | | |
| DRB1*11:83 | - | | | | | | | 6 | | | | | | 13 | 15 | | 17 | | | | 20 | | | |
| DRB1*12:01:01-12:01:02/12:02:01-12:02:04/12:03:02/12:05-12:08/12:10-12:15/12:17 | DR12, - | | | | | | | | | | | | | | 14 | | | | w | | | | | |
| DRB1*12:01:03/12:02:05/12:18-12:19/12:21/12:23-12:27 | DR12, -, Null | | | | | | | | | | | | | | 14 | | | | | | | | | |
| DRB1*12:04 | DR12 | | | | | | | | | | | | | 13 | 14 | | | | | | | | | |
| DRB1*12:09 | DR12 | | | | | | | | | | | | | | 14 | | | | | 18 | | | | |
| DRB1*12:22 | - | | | | | | | | | | 10 | | | | 14 | | | | | | | | | |
| DRB1*13:01:01-13:01:06/13:01:08-13:01:09/13:02:04/13:10/13:15-13:16/13:28/13:35/13:40/13:51/13:53/13:59/13:61:01-13:61:02/13:69/13:79-13:80/13:87/13:91-13:92/13:98/13:102/13:105/13:109/13:113N | DR13, -, Null | | | | | | | | | | | | | | | 15 | | | 18 | | | | | |
| DRB1*13:02:01/13:02:03/13:02:05/13:31/13:34/13:36/13:39/13:41/13:73-13:74/13:85/13:96/13:99/13:104 | DR13, - | | | | | | | | | 7 | | | | | | 15 | | | 18 | | | | | |
| DRB1*13:02:02 | DR13 | | | | | | | | | 7 | | | | | | w | | | 18 | | | | | |
| DRB1*13:03:01-13:04/13:12:01-13:13/13:20-13:21:02/13:24/13:30/13:33:01-13:33:03/13:38/13:48-13:49/13:55/13:58/13:66:01-13:66:02/13:75/13:78/13:81/13:88-13:90/13:94-13:95/13:101/13:108/13:111/13:115, DRB1*14:65 | DR13, -, DR13/DR11, Undefined, DR6 | | | | | | | | | | | | | | | | 16 | | 18 | | | | | |
| DRB1*13:05:01-13:05:02/13:26, DRB1*14:27 | DR13, DR14 | | | | | | | | | 7 | | | | | | 15 | | 17 | 18 | | 20 | | | |
| DRB1*13:06 | DR13 | | | | | | | | | | | | | | | 15 | | | 18 | | 20 | | | |
| DRB1*13:18/13:42 | DR13, DR6 | | | | | | | | | | | | | | | 15 | | 17 | 18 | | 20 | | | |
| DRB1*13:27 | DR13 | | | | | | 6 | | | | | | | | | 15 | | | 18 | | | | | |

| Alleles | Serology | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DRB1*13:29 | DR13 | | | | | | | 7 | | | | | | | | | 16 | | 18 | | | | | |
| DRB1*13:32/13:93 | DR13, - | | | | | | | | | | | | | | | 15 | 16 | | 18 | | | | | |
| DRB1*13:43 | DR13 | | | | | | | | | | | | | | | | 16 | | 18 | 19 | | | | |
| DRB1*13:45 | DR13 | | | | | | | | | | | | | | | | | | 18 | ? | | | | |
| DRB1*13:50:02 | DR11 | | | | | | | 7 | | | | | | | | 15 | | 17 | 18 | | w | | | |
| DRB1*13:54 | DR14 | | | | | | | | | | | | | | | | 16 | | w | | | | | |
| DRB1*13:56, DRB1*14:02-14:03:02/14:09/14:30/14:47/14:89 | DR6, DR14, DR1403/DR14, - | | | | | | | 7 | | | | | | | | | | | 18 | | 20 | | | |
| DRB1*13:63 | DR13 | | | | | | | 7 | | | | | | | | w | 16 | w | 18 | | | | | |
| DRB1*13:65 | DR13 | | | | | | | 7 | | | | | | | | 15 | 16 | | 18 | | | | | |
| DRB1*13:67/13:103 | DR13, - | | | | | | | 7 | | | | | | | | 15 | | | | | | | | |
| DRB1*13:71 | DR13 | | | | | | 6 | | | | | | | | | | 16 | | 18 | | | | | |
| DRB1*13:76, DRB1*14:01:01-14:01:03/14:05:01-14:05:03/14:07:01-14:08/14:14/14:16/14:22-14:23:03/14:25-14:26/14:32:01-14:32:02/14:35-14:36/14:38/14:42-14:45/14:49/14:53-14:56/14:58/14:60/14:62/14:69-14:70/14:72/14:74-14:75/14:86-14:88/14:90-14:92N/14:96-14:97/14:99/14:104-14:105/14:110-14:112 | DR13, DR14, DR6, Undefined, DR13/14, -, Null | | | | | | | | | | | | | | | | | | 18 | 19 | | | | |
| DRB1*13:77 | - | | | | | | | | | | | | | | | w | | | w | | 20 | | | |
| DRB1*13:112 | - | | | | | | | | | | | | | | | 15 | | | | | | | | |
| DRB1*14:06:01-14:06:02/14:12:01-14:12:02/14:17/14:29/14:52/14:80-14:81/14:83/14:106/14:108 | DR14, -, DR6 | | | | | | | | | | | | | | | | | | 18 | | 20 | | | |
| DRB1*14:13/14:85 | DR14, - | | | | | | | 7 | | | | | | | | | 16 | | 18 | | 20 | | | |
| DRB1*14:18/14:33/14:59/14:64 | DR14, DR6 | | | | | | | | | | | | | | | | | | 18 | 19 | 20 | | | |
| DRB1*14:19 | DR14 | | | | | | | ? | | | | | | | | | | | 18 | | | | | |
| DRB1*14:24 | DR14 | | | | | | | 7 | | | | | | | | | | | 18 | | | | | |
| DRB1*14:39/14:61/14:101 | DR14, - | | | | | | | | | | | | | | | | | | | 19 | | | | |
| DRB1*14:46 | DR14 | | | | | | | 7 | | | | | | | | | | | | | 20 | | | |
| DRB1*14:48 | DR14 | | | | | | | 7 | | | | | | | | | | | w | | 20 | | | |
| DRB1*14:51 | DR14 | | | | | | | 7 | | | | | | | | | | | 18 | 19 | 20 | | | |
| DRB1*14:63 | DR6 | | | | | | | 7 | | | | | | | | 15 | 16 | | 18 | | 20 | | | |
| DRB1*14:67 | DR6 | | | | | | | 7 | | | | | | | | 15 | | | 18 | | 20 | | | |
| DRB1*14:78 | - | | | | | | | | | | | | | | | 15 | 16 | | 18 | | 20 | | | |
| DRB1*14:82 | - | | | | | | 6 | | | | | | | | | | | | 18 | 19 | | | | |
| DRB1*14:95 | - | | | | | | 6 | | | | | | | | | | | | 18 | 19 | 20 | | | |
| DRB1*14:98 | - | | | | | | | 7 | | | | | | | | | | | 18 | | w | | | |
| DRB1*14:109 | - | | | | | | | 7 | | | | | | | | | | | | | | | | |
| DRB1*15:01:01:01-15:20/15:22-15:33/15:35-15:57 | DR15, -, DR2, Null | | | 3 | | | | | | | | | | | | | | | | | | | | |
| DRB1*15:21, DRB1*16:09-16:10 | DR2, DR16 | | | 3 | 4 | | | | | | | | | | | | | | | | | | | |
| DRB1*16:01:01-16:05:02/16:07/16:11-16:15/16:17 | DR16, -, Null | | | | 4 | | | | | | | | | | | | | | | | | | | |
| DRB1*16:08 | DR16 | | | | 4 | | | 7 | | | | | | | | 15 | | 17 | | | w | | | |
| DRB1*16:16 | - | | | | 4 | | | | | | | | | 13 | | | | | | | | | | |
| DRB3*01:01:02:01-01:07/01:09-01:13/01:15, DRB3*02:01-02:05/02:07-02:17/02:19/02:21-02:25/02:28, DRB3*03:01:01-03:03 | DR52, Undefined, - | | | | | | | | | | | | | | | | | | | | | | 22 | |
| DRB3*01:08, DRB3*02:20 | Undefined | | | | | | | 7 | | | | | | | | | | | | | | | 22 | |
| DRB3*01:14 | - | | | | | 5 | | | | | | | | | | | | | | | | | | |

| Alleles | Serology | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|--|--------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DRB3*02:06 | DR52 | | | | | | | ? | | | | | | | | | | | | | | | 22 | |
| DRB3*02:18 | Undefined | | | | | | | | | | | | | 13 | | | | | | | | | 22 | |
| DRB4*01:01:01:01:01:01:03:01:01/01:03:01:03:01:04/01:06-01:08, DRB4*02:01N, DRB4*03:01N | DR53, -, Undefined, Null | | | | | | | | | | | | | | | | | | | | | | | 23 |
| DRB4*01:02 | Undefined | | | | | | | ? | | | | | | | | | | | ? | | | ? | | 23 |
| DRB4*01:03:01:02N | Null | | | | | | | | | | | | ? | | | | | | | | | | | 23 |
| DRB4*01:05 | DR53 | | | | | | | | | | | | | | | | | | | | | | | ? |
| DRB5*01:01:01:01:12/01:14, DRB5*02:02-02:05 | DR51, Undefined, Null, - | | | | | | | | | | | | | | | | | | | | | 21 | | |
| DRB5*01:13 | Undefined | | | | | | | | | | | | | 13 | | | | | | | | 21 | | |

w = weak

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