

Manual No.	22
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Product No.	122
Lot No.	DR42-1 DQB11-2

CTS Collaborative Transplant Study

WORKING INSTRUCTION

HLA- DRB1* /-DQB1* CTS-PCR-SSP TRAY KIT

LOCUS- AND LOT-SPECIFIC MANUAL

To be applied to the following product:

Product No.	Description
122	HLA-DRB1* /-DQB1* CTS-PCR-SSP TRAY KIT 

1. Main differences

- **Between Lot DR42-1 (the current lot) and LotDR42-0:**
 The kit was updated to cover new alleles included in the IMGT/HLA Sequence Database of January 2017. Deleted and renamed alleles were taken into consideration.
- **Between Lot DQB11-2 (the current lot) and Lot DQB11-1:**
 The kit was updated to cover new alleles included in the IMGT/HLA Sequence Database of January 2017. Deleted and renamed alleles were taken into consideration.

2. Introduction

- Intended use: This kit reveals a low/intermediate resolution typing of HLA-DRB1* (besides HLA-DRB3*/4*/5* low resolution) and -DQB1* by the PCR-SSP method.
- Allele coverage: IMGT/HLA Sequence Database Release 3.27.0, January 2017 for HLA-DRB1* and -DQB1*, except:
 - **HLA-DRB1***01:02:12/01:18:01-01:18:02/01:22/01:33N/01:44:01-01:44:02/01:60/01:76, DRB1*04:11:04/04:156, DRB1*08:01:06/08:57/08:80, DRB1*09:09/09:23, DRB1*10:12, DRB1*11:02:03/11:04:13/11:86/11:94/11:110/11:123/11:156/11:167/11:172/11:185/11:187/11:192/11:208, DRB1*12:31N/12:42/12:57, DRB1*13:195, DRB1*15:01:22/15:34/15:115N, DRB3*02:26-02:27/02:47/02:58.
 - **HLA-DQB1***02:25/02:35/02:40/02:72, DQB1*03:17:02/03:72/03:100, DQB1*04:02:02/04:02:08/04:31, DQB1*05:01:14/05:03:10/05:21/05:60/05:72/05:73/05:82/05:98/05:105/05:116 and DQB1*06:02:08/06:03:19/06:48/06:51:02/06:153/06:167
- These alleles are considered to be rare and can be detected e. g. by sequencing with our CTS-SEQUENCE Kits (you may contact us for further information).
- This manual is only valid for **Lot No. DR42-1 DQB11-2**.
- 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).

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Table 2: Sizes of the PCR products and allele specificities of each HLA-DQB1* CTS-PCR-SSP primer mix (Lot-No DQB11-2) based on IMGT/HLA Sequence Database Release 3.27.0, January 2017	12
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Table 3: Amplification patterns of HLA-DRB1* and other HLA-DRB* alleles detected by the HLA-DRB1* CTS-PCR-SSP primer mixes (Lot No. DR42-1) based on IMGT/HLA Sequence Database Release 3.27.0, January 2017	16
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Table 4: Amplification patterns for all detectable HLA-DQB1* specificities (Lot-No DQB11-2) based on IMGT/HLA Sequence Database Release 3.27.0, January 2017	23
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4. Kit Composition

- Number of PCR primer mixes per test: 37, of which:
 - 24 mixes for HLA-DRB1 typing (23 allele-specific mixes + 1 negative control mix)
 - 13 mixes for HLA-DQB1 typing (12 allele-specific mixes + 1 negative control mix)
 - Please note: Wells (positions on tray) C5 - A5, H6 - A6, C11 - A11 and H12 - A12 are empty
- Number of tests per tray: 2
- Number of trays per kit: 10
- The primer mixes are aliquoted and dried in thin-walled, colorless 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 size of the PCR product against the Primer Mix Specificity Tables (Appendix / Table 1 and 2) to confirm the correct product size.
- Use the Amplification Pattern Tables (Appendix / Table 3 and 4) to make the allele assignments or 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 MINITRAY KITS' (Manual No. 100A) supplied along with this product.

9. Special notes

- **HLA-DRB1* locus:**
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.
- **HLA-DQB1* locus:**
Mix 6 and 7 mainly detect HLA-DQB1*03 alleles which belong to the serological group of HLA-DQ7(3). Mix 8 and 9 react positively with HLA-DQB1*03 alleles of the HLA-DQ8(3) serological group, whereas mix 10 amplifies HLA-DQB1*03 alleles which can serologically be defined as HLA-DQ9(3). Some other less common alleles are amplified by these mixes in addition.

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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13. Appendix

Table 1: Sizes of the PCR products and allele specificities of each **HLA-DRB1*** CTS-PCR-SSP primer mix (**Lot No. DR42-1**) based on IMGT/HLA Sequence Database Release 3.27.0, January 2017

Position		Mix	Allele	Serology	Size
H1	H7	Mix1	DRB1*01:01:01-01:02:11/01:03-01:17/01:19-01:21/01:23-01:32/01:34-01:38/01:39Nw-01:40Nw/01:41-01:43/01:45-01:48/01:49w/01:50-01:59/01:61-01:64/01:65:01w-01:65:02w/01:66-01:75/01:77-01:78	DR1, -, DR103, Null	140 bp
G1	G7	Mix2	DRB1*01:03/01:39Nw/01:42/01:61	DR103, Null, -	200 bp
F1	F7	Mix3	DRB1*15:01:01-01:15:01:21/15:01:23-15:33/15:35-15:112/15:113Nw/15:114/15:116-15:142, DRB1*16:09:01-16:10/16:33/16:36-16:37	DR15(2), -, DR2, Null, DR16(2)	see below
			DRB1*15:01:01:01-15:01:21/15:01:23-15:01:28/15:01:30-15:02:09/15:02:11-15:02:17/15:03:01:01-15:05/15:08/15:10/15:12-15:33/15:35-15:46/15:49-15:58/15:60-15:64/15:66:01-15:67/15:69-15:72/15:74-15:76/15:78-15:87/15:89-15:93/15:95/15:98-15:106/15:108-15:112/15:113Nw/15:114/15:116-15:124/15:126-15:129N/15:131-15:135/15:137N-15:142, DRB1*16:09:01-16:10/16:33/16:36-16:37	DR15(2), -, DR2, Null, DR16(2)	140 bp
			DRB1*15:01:01:01-15:01:06/15:01:08-15:01:13/15:01:15-15:01:21/15:01:24-15:09/15:11-15:20/15:22-15:24/15:26/15:28-15:33/15:35-15:43/15:45/15:47-15:49/15:51-15:53/15:55-15:65/15:67-15:79/15:81-15:83/15:85-15:90/15:92-15:99/15:101-15:102/15:104-15:112/15:113Nw/15:114/15:116/15:118/15:121/15:123-15:126/15:128/15:130-15:142	DR15(2), -, DR2, Null	215 bp
E1	E7	Mix4	DRB1*15:21, DRB1*16:01:01-16:01:08/16:01:09w/16:01:10-16:05:02/16:07-16:46	-, DR16(2), DR2, Null	210bp
D1	D7	Mix5	DRB1*03:01:01:01-03:01:01:02/03:01:02w/03:01:03/03:01:05-03:01:13/03:01:14w/03:01:15-03:02:01/03:02:02w/03:02:03-03:05:02/03:05:03w/03:06-03:08/03:09?/03:10-03:11:01/03:12?/03:13:01/03:13:02w/03:14-03:15:01/03:15:02w/03:16-03:41:02/03:43-03:75/03:77-03:83/03:85-03:86/03:88-03:91/03:93-03:96/03:98-03:110/03:112-03:124/03:127w/03:128-03:129/03:130w/03:131-03:134/03:135w/03:136-03:137, DRB1*11:07:01/11:07:02w/11:53/11:103:01-11:103:02/11:105/11:107/11:125/11:136/11:173, DRB1*14:104w/14:111w/14:171, DRB3*01:14w	DR17(3), -, DR18(3), DR3, Null, DR11(5)	225 bp
C1	C7	Mix6	DRB1*03:01:01:01-03:01:25/03:04:01-03:04:02/03:06/03:08/03:10-03:11:01/03:12?/03:13:01-03:13:02/03:15:01-03:16/03:18-03:20/03:22-03:23/03:25-03:26/03:28/03:30-03:34/03:36-03:37/03:39/03:42-03:48/03:50-03:52/03:54w/03:55-03:56/03:58-03:62/03:64-03:73/03:75-03:80/03:82-03:87/03:89/03:91-03:96/03:98-03:99/03:100:01w-03:100:02w/03:104/03:106-03:112/03:114/03:116-03:118/03:121/03:123-03:129/03:132-03:137, DRB1*09:06, DRB1*11:59/11:83/11:135/11:182, DRB1*13:27/13:71/13:129/13:144/13:176, DRB1*14:82/14:95/14:132, DRB3*01:34	DR17(3), -, DR3, Null, DR13(6)	220 bp
B1	B7	Mix7	DRB1*03:02:01-03:02:03/03:05:01-03:05:03/03:09/03:14/03:27/03:29/03:38/03:53/03:74/03:81/03:88/03:90/03:102-03:103/03:115/03:122/03:130-03:131, DRB1*11:09/11:20/11:28:02/11:87/11:122, DRB1*13:02:01-13:02:03/13:02:05-13:02:13/13:05:01-13:05:03/13:26:01-13:26:02/13:29/13:31/13:34/13:36/13:39/13:41/13:50:02-13:50:03/13:56/13:63/13:65/13:67/13:73-13:74/13:85/13:96:01-13:96:02/13:99/13:103-13:104/13:109/13:119-13:120/13:123-13:124/13:126/13:128/13:136/13:139-13:140/13:142N-13:143/13:145/13:147/13:155/13:157-13:159/13:165/13:168/13:170-13:171:02/13:179/13:189/13:196/13:198-13:199/13:202-13:203/13:207-13:212/13:220/13:225, DRB1*14:02:01-14:03:02/14:09/14:13/14:19?/14:24/14:27:01-14:27:02/14:30/14:46-14:48/14:51/14:63/14:67/14:85/14:89/14:98/14:109/14:115/14:134-14:135/14:144/14:174/14:179, DRB1*16:08, DRB3*01:08, DRB3*02:06?/02:20	DR18(3), -, DR3, DR11(5), DR13(6), Null, DR14(6), DR1403	190 bp

Position		Mix	Allele	Serology	Size
A1	A7	Mix8	DRB1*03:49, DRB1*04:01:01:01-04:05:11/04:05:13-04:11:03/04:12-04:155/04:157N-04:221, DRB1*08:38, DRB1*11:22/11:102:01-11:102:02/11:175, DRB1*14:10/14:57/14:143/14:161/14:182	-, DR4, Null, DR14(6)	see below
			DRB1*04:28/04:35/04:42-04:43/04:59/04:147/04:199/04:210, DRB1*11:22	DR4, -	145 bp
			DRB1*04:01:01:01-04:01:06/04:01:08-04:01:10/04:01:12-04:05:04/04:05:06-04:05:11/04:05:13-04:11:03/04:12-04:27/04:29-04:34/04:36-04:41/04:44:01-04:48/04:50-04:58/04:60-04:63/04:65/04:67-04:84/04:86-04:146/04:148-04:155/04:157N-04:161/04:163-04:173/04:175-04:191/04:193-04:195/04:197-04:198/04:200-04:209/04:211/04:94:02N/04:214N-04:219/04:221, DRB1*14:10/14:57/14:143/14:182	DR4, -, Null, DR14(6)	145 bp
			DRB1*04:01:01:01-04:01:07/04:01:09-04:01:17/04:05:01-04:05:11/04:05:13-04:05:18/04:07:01-04:09/04:14/04:16-04:17:02/04:19-04:21/04:24/04:26/04:28-04:31/04:33-04:35/04:38/04:43/04:45/04:47-04:48/04:54/04:57/04:61-04:63/04:69/04:72:01-04:72:02/04:74-04:77/04:80-04:84/04:86-04:87/04:89-04:90/04:92/04:98:01-04:98:02/04:102-04:107/04:111-04:113/04:115-04:117/04:119N/04:123/04:125/04:127-04:132/04:135/04:137/04:139-04:141/04:145/04:152-04:153/04:155/04:158N-04:160/04:162/04:166/04:170-04:175/04:178N-04:179/04:184-04:185/04:187-04:190/04:194/04:196-04:197/04:199-04:200/04:202/04:205-04:206/04:208-04:209/04:94:02N/04:214N/04:216-04:217, DRB1*11:22, DRB1*14:143	DR4, -, Null	260 bp
			DRB1*03:49, DRB1*04:28/04:35/04:42-04:43/04:59/04:147/04:199/04:210, DRB1*11:102:01-11:102:02/11:175	-, DR4	85 bp
			DRB1*04:01:01:01-04:01:06/04:01:08-04:01:10/04:01:12-04:02:03/04:02:05-04:05:04/04:05:06-04:05:11/04:05:13-04:05:16/04:05:18-04:11:03/04:12-04:27/04:29-04:34/04:36-04:41/04:44:01-04:58/04:60-04:62/04:64-04:109/04:111-04:122/04:124-04:146/04:148-04:155/04:157N-04:160/04:163-04:171/04:173/04:175-04:195/04:197-04:198/04:201/04:203-04:209/04:94:02N/04:213-04:221, DRB1*08:38, DRB1*14:161	DR4, -, Null	85 bp
			DRB1*04:01:01:01-04:01:07/04:01:09-04:01:17/04:05:01-04:05:11/04:05:13-04:05:16/04:05:18/04:07:01-04:09/04:14/04:16-04:17:02/04:19-04:21/04:24/04:26/04:28-04:31/04:33-04:35/04:38/04:43/04:45/04:47-04:48/04:54/04:57/04:61-04:62/04:64/04:66/04:69/04:72:01-04:72:02/04:74-04:77/04:80-04:84/04:86-04:87/04:89-04:90/04:92/04:98:01-04:98:02/04:102-04:107/04:111-04:113/04:115-04:117/04:119N/04:125/04:127-04:132/04:135/04:137/04:139-04:141/04:145/04:152-04:153/04:155/04:158N-04:160/04:162/04:166/04:170-04:171/04:173-04:175/04:178N-04:179/04:184-04:185/04:187-04:190/04:192/04:194/04:196-04:197/04:199/04:205-04:206/04:208-04:209/04:94:02N/04:213-04:214N/04:216-04:217, DRB1*08:38, DRB1*11:175	DR4, -, Null	200 bp
H2	H8	Mix9	DRB1*01:21w, DRB1*07:01:01:01-07:01:21/07:03-07:76	-, DR7, Null	see below
			DRB1*07:01:01:01-07:01:06/07:01:09-07:01:11/07:01:13-07:01:14/07:01:16-07:01:18/07:01:21/07:03-07:05/07:08-07:11/07:14-07:27/07:29-07:44/07:46-07:56/07:58N-07:76	DR7, -, Null	115 bp
			DRB1*01:21w, DRB1*07:01:01:01-07:01:03/07:01:05-07:01:13/07:01:15-07:01:21/07:03/07:05-07:10N/07:12-07:24/07:26N-07:31/07:33-07:34/07:36-07:58N/07:60/07:62-07:76	-, DR7, Null	190 bp

Position		Mix	Allele	Serology	Size
G2	G8	Mix10	DRB1*08:01:01-08:01:02/08:01:04-08:01:05/08:02:01-08:04:01/08:04:03-08:19/08:21-08:30:03/08:32-08:56/08:58-08:66/08:68-08:79/08:81-08:82, DRB1*11:67/11:193:01-11:193:02, DRB1*12:16:01-12:16:03/12:22/12:39/12:46, DRB1*14:04:01-14:04:03/14:15/14:28/14:31/14:50/14:68:01-14:68:02/14:71/14:73/14:76/14:79/14:93/14:107/14:120/14:138/14:145/14:148/14:152N/14:180	DR8, -, Null, DR1404, DR14(6)	see below
			DRB1*08:01:01-08:01:02/08:01:04-08:01:05/08:03:02-08:03:06/08:05-08:06/08:10/08:12/08:14/08:16-08:18/08:22-08:23/08:26-08:27/08:29/08:32-08:33/08:35-08:40/08:43/08:46/08:48/08:50/08:53-08:56/08:58/08:60N/08:62/08:64-08:66/08:68/08:70-08:71/08:74/08:76-08:79, DRB1*12:46	DR8, -, Null	165 bp
			DRB1*08:08, DRB1*14:04:01-14:04:03/14:28/14:31/14:50/14:68:01-14:68:02/14:71/14:73/14:76/14:79/14:93/14:107/14:120/14:138/14:145/14:148/14:152N/14:180	-, DR1404, DR14(6), Null	165 bp
			DRB1*08:01:01-08:01:02/08:01:04-08:01:05/08:02:01-08:04:01/08:04:03-08:04:07/08:06-08:17/08:19/08:21-08:23/08:26-08:28/08:30:01-08:30:03/08:32-08:39/08:42/08:44-08:46/08:48-08:55/08:58-08:66/08:68-08:79/08:81-08:82, DRB1*11:67, DRB1*14:15	DR8, -, Null	215 bp
			DRB1*08:01:01-08:01:02/08:01:04-08:01:05/08:02:01-08:03:06/08:05/08:07-08:09/08:11/08:13-08:19/08:21/08:23-08:27/08:29-08:30:02/08:32-08:38/08:40-08:47/08:49/08:51/08:53/08:56/08:58/08:60N-08:63/08:66/08:68-08:69/08:71-08:74/08:76-08:79, DRB1*11:193:01-11:193:02, DRB1*12:16:01-12:16:03/12:22/12:39, DRB1*14:68:01-14:68:02/14:93	DR8, -, Null	250 bp
F2	F8	Mix11	DRB1*09:01:02-09:05/09:07-09:08/09:10-09:22/09:24-09:30	DR9, -	220 bp
E2	E8	Mix12	DRB1*01:34w, DRB1*10:01:01:01-10:11/10:13-10:20	-, DR10	205 bp
D2	D8	Mix13	DRB1*01:75, DRB1*03:08/03:65, DRB1*04:15/04:61/04:138/04:145/04:154/04:170, DRB1*08:31/08:41/08:63/08:75, DRB1*11:01:01:01-11:02:02/11:02:04-11:04:12/11:04:14-11:11:01/11:11:03-11:21/11:22?/11:23:01-11:25/11:26?/11:27:01-11:39/11:40?/11:41-11:70/11:72-11:85/11:87-11:93/11:95-11:109/11:111-11:122/11:124-11:155/11:157-11:166/11:168-11:171/11:173-11:184/11:186/11:188-11:191/11:193:01-11:202/11:203w/11:204-11:207, DRB1*12:04/12:49, DRB1*14:11, DRB1*15:99/15:109, DRB1*16:16/16:27, DRB3*02:18, DRB5*01:13	-, DR4, DR11(5), DR11(5)/DR13 (6), Null, DR14(6)	125 bp
C2	C8	Mix14	DRB1*08:25/08:32/08:47/08:53, DRB1*12:01:01:01-12:01:04/12:01:05w/12:01:06-12:19/12:20w/12:21-12:30/12:32-12:41/12:43-12:56/12:58-12:64	-, DR12(5), Null	see below
			DRB1*08:32/08:53, DRB1*12:01:01:01-12:01:03/12:01:05w/12:01:06-12:02:06/12:03:02-12:13/12:15-12:19/12:20w/12:21-12:28/12:30/12:32-12:35/12:37/12:39-12:41/12:43-12:44/12:46-12:50/12:53-12:55/12:59-12:62/12:64	-, DR12(5), Null	105 bp
			DRB1*08:25/08:47, DRB1*12:01:01:01-12:01:03/12:01:03-12:01:04/12:01:05w/12:01:06-12:02:03/12:02:05-12:15/12:16:02-12:19/12:20w/12:21/12:23-12:30/12:32-12:41/12:43-12:48/12:50-12:56/12:58-12:64	-, DR12(5), Null	210 bp
B2	B8	Mix15	DRB1*03:125, DRB1*11:09/11:16/11:20/11:28:02/11:40w/11:58:01/11:59w/11:83/11:87/11:113/11:115/11:122w/11:182, DRB1*13:01:01:01-13:02:13/13:05:01-13:06/13:10/13:15-13:16/13:18/13:26:01-13:28/13:31-13:32/13:34-13:36/13:39-13:42/13:50:02-13:51/13:53/13:59/13:61:01-13:61:02/13:63w/13:65/13:67/13:69/13:73-13:74/13:79-13:80/13:85/13:87/13:91-13:93/13:96:01-13:96:02/13:98-13:99/13:102-13:105/13:109-13:110/13:111w/13:112-13:113N/13:117/13:120-13:121/13:123-13:128/13:130-13:131/13:136-13:148/13:153/13:155-13:160/13:165-13:166/13:168/13:170-13:171:02/13:173/13:176-13:177/13:179/13:183-13:187/13:189-13:191/13:198-13:203/13:205/13:207-13:215/13:217-13:218/13:220-13:222/13:223w/13:225-13:226, DRB1*14:27:01-14:27:02/14:63/14:67/14:78, DRB1*16:08	-, DR11(5), DR11(5)/DR13 (6), DR13(6), Null, DR14(6)	130 bp

Position		Mix	Allele	Serology	Size
A2	A8	Mix16	DRB1*03:12?, DRB1*11:03:01-11:03:02/11:11:01/11:11:03/11:36/11:40-11:41/11:55/11:59/11:63:01-11:63:02/11:68/11:76/11:85/11:122/11:138-11:139/11:151/11:161/11:168/11:176, 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?/13:58/13:63/13:65-13:66:02/13:71/13:75/13:78/13:81/13:88-13:90/13:93-13:95/13:101/13:108/13:111/13:115/13:118/13:120/13:122/13:133-13:134/13:139/13:149/13:151-13:152/13:154/13:161/13:164/13:167/13:169/13:174/13:188/13:194/13:216/13:219/13:227-13:228/13:230, DRB1*14:13/14:63/14:65/14:78/14:85/14:169-14:170	DR3, DR11(5), -, DR13(6), DR14(6)	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?/13:58/13:65-13:66:02/13:75/13:81/13:88-13:90/13:93-13:95/13:101/13:108/13:115/13:118/13:120/13:122/13:133-13:134/13:139/13:151-13:152/13:154/13:161/13:164/13:167/13:169/13:174/13:188/13:194/13:216/13:219/13:227-13:228/13:230, DRB1*14:13/14:63/14:65/14:78/14:85/14:169-14:170	DR3, DR13(6), -, DR14(6)	170 bp
			DRB1*03:12?, DRB1*11:03:01-11:03:02/11:11:01/11:11:03/11:36/11:40-11:41/11:55/11:59/11:63:01-11:63:02/11:68/11:76/11:85/11:122/11:138-11:139/11:151/11:161/11:168/11:176, DRB1*13:20-13:21:02/13:24/13:29/13:43/13:49/13:54/13:55?/13:63/13:71/13:75/13:78/13:108/13:111/13:149, DRB1*14:13/14:65/14:85/14:169-14:170	DR3, DR11(5), -, DR13(6), DR14(6)	200 bp
H3	H9	Mix17	DRB1*11:09/11:28:02/11:40w/11:58:01/11:59w/11:83/11:87/11:113/11:115/11:122w/11:182, DRB1*13:05:01-13:05:03/13:18/13:26:01-13:26:02/13:42/13:50:02-13:50:03/13:63w/13:111w/13:136/13:144/13:158/13:189/13:199/13:203, DRB1*14:27:01-14:27:02, DRB1*16:08	DR11(5), -, DR13(6), DR14(6)	130 bp

Position	Mix	Allele	Serology	Size	
G3	G9	Mix18	DRB1*03:01:01:01-03:01:06/03:01:07w/03:01:08-03:01:13/03:01:14w/03:01:15-03:07/03:09?/03:10-03:11:01/03:12?/03:13:01-03:37/03:38w/03:39-03:41:02/03:43-03:45/03:46w/03:47-03:58/03:59w/03:60-03:64/03:66-03:78/03:79w/03:80-03:86/03:88-03:110/03:112-03:126/03:127w/03:128-03:129/03:130w/03:131-03:134/03:135w/03:136-03:137, DRB1*08:01:01-08:01:02/08:01:04-08:01:05/08:02:01-08:04:01/08:04:03-08:24:02/08:25w/08:26-08:30:03/08:32-08:33/08:34w/08:35-08:40/08:42-08:46/08:47w/08:48-08:51/08:52w/08:53-08:56/08:58-08:62/08:64-08:68/08:70-08:74/08:76-08:79/08:81-08:82, DRB1*12:01:01:01w-12:01:07w/12:01:09w-12:02:05w/12:02:07w-12:03:03w/12:05w-12:08w/12:09/12:10w-12:17w/12:19w-12:23w/12:24N-12:25/12:26w-12:30w/12:32w/12:34w-12:41w/12:43w-12:45w/12:46/12:48/12:50w-12:53w/12:54/12:55w-12:56w/12:58w-12:61w/12:62/12:63w-12:64w, DRB1*13:01:01:01-13:02:11/13:02:12w/13:02:13-13:29/13:30?/13:31-13:53/13:54w/13:55?/13:56-13:66:02/13:68-13:76/13:77w/13:78-13:99/13:100w/13:101-13:102/13:103w/13:104-13:159/13:160w/13:161/13:162w/13:163-13:164/13:165w/13:166-13:182/13:184-13:194/13:196-13:198/13:199w/13:201-13:217/13:218w/13:219-13:227/13:229-13:231, DRB1*14:01:01-14:09/14:12:01-14:38:02/14:40-14:45/14:47/14:48w/14:49-14:54:01/14:54:03-14:56/14:58-14:60/14:62-14:65/14:67-14:124/14:125w/14:126:01-14:140/14:142/14:144-14:147/14:149-14:176/14:177w/14:178-14:181/14:183-14:184, DRB3*01:14w	DR17(3), -, DR18(3), DR3, Null, DR8, DR12(5), DR13(6), DR14(6), DR1403, DR1404, DR6	see below
			DRB1*03:01:06/03:01:07w/03:01:09/03:01:14w/03:01:15/03:09?/03:13:01-03:13:02/03:46w/03:50/03:59w/03:64/03:67N/03:69/03:86/03:88/03:117/03:130w/03:135w, DRB1*13:02:12w/13:39/13:78-13:79/13:103w/13:112/13:121/13:128/13:142N/13:160w/13:163/13:165w/13:173/13:181/13:199w/13:218w, DRB1*14:08/14:23:02/14:34/14:64/14:72/14:109/14:115/14:130	DR17(3), -, Null, DR14(6)	170 bp
			DRB1*03:10, DRB1*13:43/13:45/13:159/13:171:01/13:179/13:191/13:197/13:217, DRB1*14:01:01-14:01:04/14:07:01-14:07:02/14:16/14:22/14:25-14:26/14:32:01-14:32:03/14:35/14:38:01-14:38:02/14:49/14:53-14:54:01/14:54:03-14:55/14:58/14:60/14:62/14:69-14:70/14:74-14:75/14:82/14:86-14:88/14:90/14:92N/14:97/14:99/14:101/14:104-14:105/14:110-14:114/14:117-14:119/14:122/14:124/14:125w/14:128-14:129/14:131-14:133/14:137N/14:139-14:140/14:142/14:146-14:147/14:149-14:151/14:153/14:157-14:158/14:162-14:164/14:166N/14:168/14:171-14:173/14:178/14:184	DR17(3), -, DR14(6), DR6, DR13(6), Null	175 bp
			DRB1*03:01:01:01-03:01:05/03:01:07w/03:01:08-03:01:13/03:01:14w/03:01:15-03:07/03:09?/03:11:01/03:12?/03:13:01-03:37/03:38w/03:39-03:41:02/03:43-03:45/03:47-03:58/03:59w/03:60-03:63/03:66-03:78/03:79w/03:80-03:86/03:88-03:91/03:93-03:110/03:112-03:126/03:127w/03:128-03:129/03:131-03:134/03:135w/03:136-03:137, DRB1*08:20, DRB1*13:01:01:01-13:02:11/13:02:12w/13:02:13-13:16/13:18-13:29/13:30?/13:31-13:42/13:44/13:46-13:53/13:54w/13:55?/13:56-13:66:02/13:68-13:76/13:77w/13:78-13:99/13:100w/13:101-13:102/13:103w/13:104-13:115/13:117-13:158/13:160w/13:161/13:162w/13:163-13:164/13:166-13:170/13:171:02-13:174/13:176-13:178/13:180-13:182/13:184-13:190/13:192-13:194/13:196/13:198/13:199w/13:201-13:213/13:215-13:216/13:218w/13:219-13:227/13:229-13:231, DRB1*14:02:01-14:03:02/14:05:01-14:06:03/14:09/14:12:01-14:14/14:17-14:21/14:23:01/14:23:03-14:24/14:27:01-14:27:02/14:29-14:30/14:33/14:36-14:37/14:40-14:45/14:47/14:48w/14:51/14:56/14:59/14:63-14:65/14:67/14:77-14:78/14:80-14:81/14:83-14:85/14:89/14:91/14:94-14:96/14:98/14:100/14:102-14:103/14:106/14:108-14:109/14:115-14:116/14:121/14:123/14:127:01-14:127:02/14:130/14:134-14:136/14:144/14:154-14:156/14:159-14:161/14:165/14:167/14:169-14:170/14:174/14:176/14:177w/14:179/14:181/14:183, DRB3*01:14w	DR17(3), -, DR18(3), DR3, Null, DR13(6), DR14(6), DR1403, DR6	175 bp
			DRB1*08:15/08:21, DRB1*12:48	-	165 bp
			DRB1*08:08, DRB1*14:04:01-14:04:03/14:28/14:31/14:50/14:68:01-14:68:02/14:71/14:73/14:76/14:79/14:93/14:107/14:120/14:138/14:140/14:145/14:152N/14:180	-, DR1404, DR14(6), Null	165 bp

Position		Mix	Allele	Serology	Size
			DRB1*03:92, DRB1*08:01:01-08:01:02/08:01:04-08:01:05/08:02:01-08:04:01/08:04:03-08:07/08:09-08:14/08:16-08:19/08:21-08:24:02/08:25w/08:26-08:30:03/08:32-08:33/08:34w/08:35-08:40/08:42-08:46/08:47w/08:48-08:51/08:52w/08:53-08:56/08:58-08:62/08:64-08:68/08:70-08:74/08:76-08:79/08:81-08:82, DRB1*12:01:01:01w-12:01:07w/12:01:09w-12:02:05w/12:02:07w-12:03:03w/12:05w-12:08w/12:09/12:10w-12:17w/12:19w-12:23w/12:24N-12:25/12:26w-12:30w/12:32w/12:34w-12:41w/12:43w-12:45w/12:46/12:48/12:50w-12:53w/12:54/12:55w-12:56w/12:58w-12:61w/12:62/12:63w-12:64w, DRB1*13:17/13:116/13:175/13:214, DRB1*14:15/14:52/14:126:01-14:126:02/14:175	-, DR8, Null, DR12(5), DR13(6)	170 bp
F3	F9	Mix19	DRB1*03:10/03:97/03:126, DRB1*08:08/08:29, DRB1*11:17/11:52-11:54:02/11:89/11:150/11:159/11:202, DRB1*13:43/13:45/13:76/13:159/13:171:01/13:179/13:188/13:191/13:197/13:206/13:217, DRB1*14:01:01-14:01:04/14:04:01-14:05:04/14:07:01-14:08/14:11/14:14/14:16/14:18/14:22-14:23:04/14:25-14:26/14:28/14:31-14:33/14:35-14:36/14:38:01-14:39/14:42-14:45/14:49-14:51/14:53-14:56/14:58-14:62/14:64/14:68:01-14:76/14:79/14:82/14:86-14:88/14:90-14:93/14:95-14:97/14:99/14:101/14:103-14:107/14:110-14:114/14:117-14:120/14:122/14:124/14:125w/14:126:01-14:126:02/14:128-14:134/14:137N-14:140/14:142/14:145-14:155/14:157-14:158/14:160-14:164/14:166N-14:169/14:171-14:173/14:175/14:178/14:180/14:184	DR17(3), -, DR11(5), DR14(6), DR1404, DR6, DR13(6), Null	see below
			DRB1*08:08, DRB1*14:04:01-14:04:03/14:28/14:31/14:50/14:61/14:68:01-14:68:02/14:71/14:73/14:76/14:79/14:93/14:107/14:120/14:138/14:145/14:152N/14:180	-, DR1404, DR14(6), Null	175 bp
			DRB1*08:29, DRB1*14:04:01-14:04:02/14:11/14:28/14:50/14:61/14:68:01/14:71/14:73/14:93/14:120/14:126:01-14:126:02/14:138/14:145/14:148/14:152N/14:175	-, DR1404, DR14(6), Null	225 bp
			DRB1*03:10, DRB1*13:43/13:45/13:159/13:171:01/13:179/13:191/13:197/13:217, DRB1*14:01:01-14:01:04/14:07:01-14:07:02/14:16/14:22/14:25-14:26/14:32:01-14:32:03/14:35/14:38:01-14:39/14:49/14:53-14:54:01/14:54:03-14:55/14:58/14:60/14:62/14:69-14:70/14:74-14:75/14:82/14:86-14:88/14:90/14:92N/14:97/14:99/14:104-14:105/14:110-14:114/14:117-14:119/14:122/14:124/14:125w/14:128-14:129/14:131-14:133/14:137N/14:139-14:140/14:142/14:146-14:147/14:149-14:151/14:153/14:157-14:158/14:162-14:164/14:166N/14:168/14:171-14:173/14:184	DR17(3), -, DR14(6), DR6, DR13(6), Null	175 bp
			DRB1*03:97/03:126, DRB1*11:17/11:52-11:54:02/11:89/11:150/11:159/11:202, DRB1*13:76/13:188/13:206, DRB1*14:01:01-14:01:04/14:05:01-14:05:04/14:07:01-14:08/14:14/14:18/14:23:01-14:23:04/14:26/14:33/14:35-14:36/14:38:01/14:39/14:42-14:45/14:51/14:54:01-14:54:05/14:56/14:58-14:60/14:62/14:64/14:70/14:72/14:75/14:82/14:86/14:88/14:90-14:92N/14:95-14:97/14:99/14:101/14:103/14:106/14:110/14:112-14:114/14:117-14:118/14:122/14:124/14:125w/14:129-14:134/14:137N/14:139-14:140/14:142/14:146-14:147/14:149-14:151/14:153-14:155/14:157-14:158/14:160-14:163/14:166N-14:169/14:178/14:184	-, DR11(5), DR14(6), DR6, Null	225 bp

Position	Mix	Allele	Serology	Size	
E3	E9	Mix20	DRB1*03:126, DRB1*04:211, DRB1*11:09/11:28:02w/11:58:01w/11:83/11:87/11:113/11:115w/11:182, DRB1*12:58, DRB1*13:05:01-13:06/13:18/13:26:01-13:26:02/13:42/13:50:02w-13:50:03w/13:56/13:77/13:119/13:136/13:144/13:146/13:156-13:158/13:163/13:181/13:189w/13:193/13:199/13:203, DRB1*14:02:01-14:03:02/14:06:01-14:06:03/14:09/14:12:01-14:13/14:17-14:18/14:27:01-14:27:02/14:29-14:30/14:33/14:46-14:48/14:51-14:52/14:59/14:63-14:64/14:67/14:78/14:80-14:81/14:83/14:85/14:89/14:95/14:98w/14:106/14:108/14:115/14:121/14:132-14:135/14:144/14:154/14:165/14:170/14:174/14:176-14:177/14:179, DRB1*16:08w	-, DR11(5), DR13(6), DR14(6), DR1403, DR6	see below
			DRB1*03:126, DRB1*04:211, DRB1*11:09/11:28:02w/11:58:01w/11:83/11:87/11:113/11:115w/11:182, DRB1*12:58, DRB1*13:05:01-13:06/13:18/13:26:01-13:26:02/13:42/13:50:02w-13:50:03w/13:56/13:77/13:136/13:157/13:163/13:181/13:189w/13:193/13:199/13:203, DRB1*14:02:01-14:02:03/14:06:01-14:06:03/14:09/14:13/14:17-14:18/14:29-14:30/14:33/14:46-14:48/14:51-14:52/14:59/14:64/14:80-14:81/14:83/14:95/14:98w/14:106/14:108/14:121/14:132-14:134/14:154/14:165/14:170/14:176-14:177/14:179, DRB1*16:08w	-, DR11(5), DR13(6), DR14(6), DR6	145 bp
			DRB1*13:18/13:119/13:144/13:146/13:156/13:158, DRB1*14:03:01-14:03:02/14:12:01-14:12:02/14:27:01-14:27:02/14:63/14:67/14:78/14:85/14:89/14:98w/14:115/14:135/14:144/14:174	DR13(6), -, DR1403, DR14(6)	150 bp
D3	D9	Mix21	DRB1*09:07, DRB4*01:02?, DRB5*01:01:01-01:25/01:26w/01:27N-01:29, DRB5*02:02-02:16	-, DR51, Null	see below
			DRB4*01:02?, DRB5*01:01:01-01:11/01:14-01:25/01:26w/01:27N-01:29, DRB5*02:02-02:16	-, DR51, Null	175 bp
			DRB5*01:13	-	175 bp
			DRB1*09:07, DRB4*01:02?, DRB5*01:12	-	210 bp
C3	C9	Mix22	DRB1*03:42/03:87, DRB1*14:141, DRB3*01:01:02:01-01:13/01:15-01:41, DRB3*02:01-02:25/02:28-02:46/02:48-02:57/02:59-02:61Q, DRB3*03:01:01-03:11	-, DR52, Null	215 bp
B3	B9	Mix23	DRB4*01:01:01-01:04/01:05?/01:06-01:07:02/01:08?/01:09-01:22/01:23w/01:24-01:26/01:27?/01:28-01:48, DRB4*02:01N, DRB4*03:01N	DR53, -, Null	see below
			DRB4*01:01:01-01:04/01:05?/01:06-01:07:02/01:09-01:22/01:23w/01:24-01:26/01:28-01:48, DRB4*02:01N	DR53, -, Null	215 bp
			DRB4*01:01:01-01:04/01:05?/01:06-01:07:02/01:09-01:22/01:23w/01:24-01:26/01:28-01:48, DRB4*02:01N, DRB4*03:01N	DR53, -, Null	255 bp
A3	A9	Mix24	Negative Control	-	None (440 bp)

Mix 7: HLA-DRB1*03:81 serology unclear.

Amplification control (internal positive control): 440 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: Sizes of the PCR products and allele specificities of each **HLA-DQB1*** CTS-PCR-SSP primer mix (**Lot-No DQB11-2**) based on IMGT/HLA Sequence Database Release 3.27.0, January 2017

Position		Mix	Allele	Serology	Size
H4	H10	Mix 1	DQB1*04:10w, DQB1*05:01:01:01-05:01:13/05:01:15/05:01:16w/05:01:17-05:01:18/05:01:19w/05:01:20-05:03:09/05:03:11-05:20/05:22-05:25/05:26w/05:27-05:33/05:34w/05:35-05:43:02/05:44w/05:45-05:59/05:61-05:71/05:74-05:81/05:83-05:97/05:99-05:104/05:106-05:112/05:113w/05:114-05:115/05:117-05:127/05:128Nw/05:129/05:130w/05:131-05:143, DQB1*06:23/06:156/06:162/06:169	-, DQ5(1), Null	see below
			DQB1*04:10w, DQB1*05:03:02/05:43:02, DQB1*06:23/06:156/06:162/06:169	-, DQ5(1)	135 bp
			DQB1*05:01:01:01-05:01:13/05:01:15/05:01:16w/05:01:17-05:01:18/05:01:19w/05:01:20-05:03:09/05:03:11-05:20/05:22-05:25/05:26w/05:27-05:33/05:34w/05:35-05:43:02/05:44w/05:45-05:59/05:61-05:71/05:74-05:81/05:83-05:97/05:99-05:104/05:106-05:112/05:113w/05:114-05:115/05:117-05:127/05:128Nw/05:129/05:130w/05:131-05:143	DQ5(1), -, Null	225 bp
G4	G10	Mix 2	DQB1*03:194, DQB1*06:01:01-06:01:15/06:02:07/06:03:01-06:03:06/06:03:08-06:03:18/06:03:20-06:03:26/06:08:01-06:08:03/06:11:02-06:12/06:14:01/06:14:03/06:17/06:21/06:26N/06:28/06:30-06:31/06:35/06:40-06:45/06:53:01-06:57/06:59-06:65/06:67/06:82/06:87/06:90-06:92/06:98-06:105/06:108/06:110/06:120/06:128/06:132-06:134/06:140-06:145/06:148/06:149w/06:154/06:157/06:165/06:168/06:170/06:177/06:181/06:184-06:185/06:187/06:190:01-06:191/06:194-06:196/06:199/06:203/06:205/06:209-06:210/06:214/06:218/06:221-06:223/06:229-06:230	-, DQ6(1), DQ1, Null	see below
			DQB1*06:01:01-06:01:15/06:35/06:43/06:45/06:53:01-06:57/06:98-06:105/06:108/06:120/06:132/06:140/06:142/06:157/06:168/06:177/06:181/06:194/06:205/06:209/06:214/06:229	DQ6(1), -, Null	160 bp
			DQB1*03:194, DQB1*06:02:07/06:03:01-06:03:06/06:03:08-06:03:18/06:03:20-06:03:26/06:08:01-06:08:03/06:11:02-06:12/06:14:01/06:14:03/06:17/06:21/06:26N/06:28/06:30-06:31/06:40-06:42/06:44/06:59-06:65/06:67/06:82/06:87/06:90-06:92/06:110/06:128/06:133-06:134/06:141/06:143-06:145/06:148/06:149w/06:154/06:165/06:170/06:184-06:185/06:187/06:190:01-06:191/06:195-06:196/06:199/06:203/06:210/06:218/06:221-06:223/06:230	-, DQ6(1), DQ1, Null	170 bp

Position		Mix	Allele	Serology	Size
F4	F10	Mix 3	DQB1*03:08/03:137/03:228, DQB1*06:02:01:01-06:02:07/06:02:09-06:03:03/06:03:05w/06:03:06-06:03:07/ 06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:25/06:08:01/06:10-06:11:03/06:13:01-06:14:02/ 06:16/06:19:01-06:20/06:23-06:24/06:26N/06:28-06:31/06:33/06:40-06:41/06:44/06:46-06:47/06:49-06:50/06:60- 06:63/06:65w/06:67-06:68/06:70-06:84/06:87/06:90/06:92/06:95-06:97/06:106-06:107/06:109-06:117/06:119/ 06:122-06:128/06:130-06:131/06:133-06:134/06:136-06:138/06:141/06:143-06:144N/06:146:01-06:148/06:150- 06:152/06:154/06:156/06:159/06:161-06:163/06:165-06:166/06:169-06:170/06:173-06:176/06:178-06:179N/06:182- 06:185/06:187-06:188/06:191-06:192/06:195/06:197-06:200/06:201w/06:203/06:206:01-06:206:02/06:208/06:210- 06:211/06:213/06:215-06:216N/06:218-06:219/06:221-06:228/06:230	-, DQ6(1), DQ1, Null	see below
			DQB1*03:08/03:137/03:228, DQB1*06:02:01:01-06:02:06/06:02:09-06:02:26/06:03:07/06:10-06:11:01/06:13:01- 06:13:02/06:14:02/06:16/06:19:01-06:20/06:24/06:29/06:33/06:46-06:47/06:49-06:50/06:68/06:70-06:81/06:83- 06:84/06:95-06:97/06:106-06:107/06:109/06:111-06:117/06:119/06:122-06:127/06:130-06:131/06:136-06:138/ 06:146:01-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178-06:179N/06:182-06:183/ 06:188/06:192/06:197-06:198/06:200/06:201w/06:206:01-06:206:02/06:208/06:211/06:213/06:215-06:216N/06:219/ 06:224-06:228	-, DQ6(1), DQ1, Null	165 bp
			DQB1*06:02:01:01-06:02:04/06:02:06-06:02:07/06:02:09-06:02:15/06:02:17-06:02:18/06:02:20-06:03:03/06:03:05w/ 06:03:06-06:03:07/06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:25/06:08:01/06:10-06:11:03/ 06:13:01/06:14:01-06:14:02/06:16/06:19:02-06:20/06:23-06:24/06:26N/06:28-06:31/06:33/06:40-06:41/06:44/06:46- 06:47/06:49-06:50/06:60-06:63/06:65w/06:67-06:68/06:70-06:79:01/06:80-06:84/06:87/06:90/06:92/06:95-06:97/ 06:106-06:107/06:109-06:113/06:115-06:117/06:122/06:124-06:128/06:130-06:131/06:133-06:134/06:136-06:137/ 06:141/06:143-06:144N/06:146:01-06:148/06:151/06:154/06:156/06:159/06:161-06:163/06:165-06:166/06:169- 06:170/06:173-06:176/06:178-06:179N/06:182-06:185/06:187-06:188/06:191-06:192/06:195/06:197-06:200/ 06:201w/06:203/06:206:01/06:208/06:210-06:211/06:213/06:216N/06:218-06:219/06:221-06:228/06:230	DQ6(1), -, DQ1, Null	105 bp
E4	E10	Mix 4	DQB1*06:04:01-06:07:02/06:09:01:01-06:09:03/06:09:05/06:09:06w/06:18:01-06:18:02/06:22:02/06:25/06:27:01- 06:27:02/06:32:01-06:32:02/06:34/06:36/06:38-06:39/06:52/06:58/06:66/06:69/06:85-06:86/06:88-06:89/06:93- 06:94/06:118:01-06:118:02/06:121w/06:129/06:135/06:142/06:155/06:158N/06:160/06:164/06:168/06:171-06:172/ 06:180/06:186/06:189/06:193N/06:202/06:204/06:207/06:212w/06:217	DQ6(1), -, Null	170 bp
D4	D10	Mix 5	DQB1*02:01:01-02:01:23/02:01:24w/02:02:01:01-02:24/02:26-02:34/02:36/02:37w/02:38-02:39/02:41-02:45/02:46w- 02:47w/02:48-02:71/02:73-02:88	DQ2, -, Null	200 bp

Position		Mix	Allele	Serology	Size
C4	C10	Mix 6	DQB1*03:01:01:01-03:01:37/03:04:01-03:04:03/03:09-03:10:02/03:13-03:14:02/03:16/03:19:01-03:19:02/03:21-03:24/03:27-03:29/03:35/03:36w/03:42/03:44/03:46-03:60/03:69/03:71/03:73/03:75-03:77/03:80/03:82-03:84N/03:92-03:94/03:101-03:103/03:108-03:109/03:114-03:116/03:118N-03:121/03:122w/03:127-03:131/03:133-03:135/03:138-03:140/03:142-03:144/03:147/03:150/03:151w/03:152/03:154/03:157-03:160/03:162-03:167/03:169-03:170/03:171w/03:172-03:173/03:180/03:182-03:183/03:186-03:188/03:191-03:198/03:201-03:202/03:206-03:208/03:216-03:219/03:231-03:232/03:235-03:236/03:241-03:243/03:246/03:252-03:256, DQB1*04:10, DQB1*05:03:02?, DQB1*06:35/06:53:01-06:53:02	DQ7(3), -, DQ3, Null, DQ5(1)	see below
			DQB1*03:01:01:01-03:01:37/03:04:01-03:04:03/03:09/03:13/03:16/03:19:01-03:19:02/03:21-03:22/03:24/03:27-03:29/03:35/03:36w/03:42/03:44/03:46-03:60/03:69/03:71/03:73/03:75-03:77/03:80/03:82-03:84N/03:92-03:94/03:101-03:103/03:108-03:109/03:114-03:116/03:118N-03:121/03:122w/03:127/03:129-03:131/03:133-03:135/03:139-03:140/03:142-03:144/03:147/03:150/03:151w/03:152/03:154/03:157-03:160/03:162-03:167/03:169-03:170/03:171w/03:172-03:173/03:182/03:186-03:188/03:191-03:194/03:196-03:198/03:201-03:202/03:206-03:208/03:216/03:218-03:219/03:231-03:232/03:235-03:236/03:241-03:243/03:246/03:252-03:256, DQB1*06:35/06:53:01-06:53:02	DQ7(3), -, Null	100 bp
			DQB1*03:01:01:01-03:01:37/03:04:01-03:04:03/03:09-03:10:02/03:13-03:14:02/03:16/03:19:01-03:19:02/03:21-03:22/03:24/03:27-03:29/03:35/03:36w/03:42/03:44/03:46-03:60/03:69/03:71/03:73/03:75-03:77/03:80/03:82-03:84N/03:92-03:94/03:101-03:103/03:108-03:109/03:114-03:116/03:118N-03:121/03:122w/03:127-03:131/03:133-03:135/03:138-03:140/03:142-03:144/03:147/03:150/03:151w/03:152/03:154/03:157-03:160/03:162-03:167/03:169-03:170/03:171w/03:172-03:173/03:180/03:182-03:183/03:186-03:188/03:191-03:198/03:201-03:202/03:206-03:207/03:216/03:218-03:219/03:231-03:232/03:235-03:236/03:241-03:243/03:246/03:252-03:256	DQ7(3), -, DQ3, Null	215 bp
			DQB1*03:23:01-03:23:02/03:217, DQB1*04:10, DQB1*05:03:02?	-, DQ5(1)	120 bp
B4	B10	Mix 7	DQB1*03:04:01-03:04:03/03:14:01-03:14:02/03:70/03:80/03:179w	DQ7(3), -	175 bp
A4	A10	Mix 8	DQB1*03:02:01:01-03:02:09/03:02:11-03:02:13/03:02:14w/03:02:15/03:02:17-03:02:24/03:07-03:08/03:11/03:32/03:37/03:45/03:62-03:64/03:66N-03:68/03:70/03:81/03:85/03:106-03:107/03:125/03:146/03:153/03:161/03:174-03:175/03:178-03:179/03:184-03:185/03:189-03:190/03:199/03:203-03:205/03:210-03:211/03:213N-03:215/03:220-03:221/03:223-03:224/03:228-03:229/03:233/03:237N/03:240/03:245/03:247/03:251, DQB1*06:29/06:37/06:123/06:139	DQ8(3), -, Null	see below
			DQB1*03:02:01:01-03:02:09/03:02:11-03:02:13/03:02:14w/03:02:15/03:02:17-03:02:24/03:07-03:08/03:11/03:32/03:37/03:45/03:62-03:64/03:66N-03:68/03:70/03:81/03:85/03:106-03:107/03:125/03:146/03:153/03:161/03:174-03:175/03:178-03:179/03:184-03:185/03:189-03:190/03:199/03:203-03:205/03:210-03:211/03:213N-03:215/03:220-03:221/03:223-03:224/03:228-03:229/03:233/03:237N/03:240/03:245/03:247/03:251, DQB1*06:29/06:123/06:139	DQ8(3), -, Null	130 bp
			DQB1*06:37	-	145 bp
H5	H11	Mix 9	DQB1*03:05:01-03:05:04/03:61/03:132/03:181/03:226/03:250	DQ8(3), -	135 bp

Position		Mix	Allele	Serology	Size
G5	G11	Mix 10	DQB1*03:03:02:01-03:03:13/03:06/03:12/03:15/03:20/03:25:01-03:26/03:30-03:31/03:33-03:34/03:38-03:41/03:43/03:65/03:74/03:78w/03:79/03:86-03:91Q/03:95N-03:99Q/03:104-03:105/03:111-03:113/03:117/03:123-03:124/03:126/03:136-03:137/03:141/03:145/03:155-03:156/03:168/03:176-03:177/03:200/03:209/03:212/03:222/03:227/03:230/03:234/03:238-03:239/03:248-03:249, DQB1*04:03:01-04:03:02, DQB1*06:09:04/06:15:01/06:15:02w/06:22:01/06:22:03/06:46/06:51:01/06:96/06:119	DQ9(3), -, DQ3, Null	see below
			DQB1*03:03:02:01-03:03:13/03:06/03:12/03:15/03:20/03:25:01-03:26/03:30-03:31/03:33-03:34/03:38-03:41/03:43/03:65/03:74/03:78w/03:79/03:86-03:91Q/03:95N-03:99Q/03:104-03:105/03:111-03:113/03:117/03:123-03:124/03:126/03:136-03:137/03:141/03:145/03:155-03:156/03:168/03:176-03:177/03:200/03:209/03:212/03:222/03:227/03:230/03:234/03:238-03:239/03:248-03:249, DQB1*04:03:01-04:03:02, DQB1*06:51:01/06:96	DQ9(3), -, DQ3, Null	130 bp
			DQB1*06:09:04/06:15:01/06:15:02w/06:22:01/06:22:03/06:46/06:119	-	215 bp
F5	F11	Mix 11	DQB1*03:01:01:01-03:01:01:05/03:01:03-03:01:05/03:01:06w/03:01:07-03:02:02/03:02:04w/03:02:05-03:02:12/03:02:13w/03:02:14-03:02:22/03:02:24-03:03:02:04/03:03:04-03:04:03/03:05:03-03:05:04/03:07-03:17:01/03:18-03:19:02/03:21-03:22/03:23:02-03:24/03:25:02-03:36/03:38-03:53/03:54w/03:55-03:60/03:62-03:71/03:74/03:76-03:99Q/03:101-03:111/03:113-03:117/03:119-03:128/03:130-03:131/03:133-03:135/03:137-03:155/03:157-03:161/03:163-03:174/03:176-03:180/03:182/03:184-03:203/03:204w/03:205-03:222/03:224-03:225/03:227-03:236/03:239-03:249/03:251/03:253-03:256, DQB1*05:11:01, DQB1*06:02:02/06:03:02/06:04:08	DQ7(3), -, DQ8(3), DQ9(3), Null, DQ6(1)	160 bp
E5	E11	Mix 12	DQB1*03:132, DQB1*04:01:01-04:02:01:03/04:02:03-04:02:07/04:02:09-04:03:01/04:04-04:30/04:32-04:39	-, DQ4, Null	210 bp
D5	D11	Mix 13	Negative control		None (440 bp)

Amplification control (internal positive control): 440 base pairs (bp)

Positions: C5 - A5, H6 - A6, C11 - A11 and H12 - A12 are empty wells.

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)

Mix 6, HLA-DQB1*03:10: a rare allele according to Mack SJ et al., Tissue Antigens 2013, serological equivalent is controversially discussed (DQ3, DQ7 or DQ8).

Table 3: Amplification patterns of **HLA-DRB1*** and other HLA-DRB* alleles detected by the HLA-DRB1* CTS-PCR-SSP primer mixes (**Lot No. DR42-1**) based on IMGT/HLA Sequence Database Release 3.27.0, January 2017

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
DRB1*01:01:01:01:01:02:11/01:04-01:17/01:19-01:20:02/01:23-01:32/01:35-01:38/01:41:01:43/01:45-01:48/01:50-01:59/01:62N-01:64/01:66-01:74/01:77-01:78	DR1, -, Null	1																						
DRB1*01:03/01:42/01:61	DR103, -	1	2																					
DRB1*01:21	-	1								w														
DRB1*01:34	-	1											w											
DRB1*01:39N	Null	w	w																					
DRB1*01:40N/01:49/01:65:01-01:65:02	Null, -	w																						
DRB1*01:75	-	1												13										
DRB1*03:01:01:01:01:03:01:01:02/03:01:03/03:01:05-03:01:06/03:01:08-03:01:13/03:01:15-03:01:25/03:04:01-03:04:02/03:06/03:11:01/03:13:01/03:15:01/03:16/03:18-03:20/03:22-03:23/03:25-03:26/03:28/03:30-03:34/03:36-03:37/03:39/03:43-03:45/03:47-03:48/03:50-03:52/03:55-03:56/03:58/03:60-03:62/03:64/03:66-03:73/03:75/03:77-03:78/03:80/03:82-03:83/03:85-03:86/03:89/03:91/03:93-03:96/03:98-03:99/03:104/03:106-03:110/03:112/03:114/03:116-03:118/03:121/03:123-03:124/03:128-03:129/03:132-03:134/03:136-03:137	DR17(3), -, DR3, Null					5	6												18					
DRB1*03:01:02/03:13:02/03:15:02	DR17(3), -					w	6												18					
DRB1*03:01:04/03:76/03:84/03:92, DRB1*13:129	DR17(3), -						6												18					
DRB1*03:01:07/03:46/03:59/03:79	DR17(3), -					5	6												w					
DRB1*03:01:14/03:127/03:135	-					w	6												w					
DRB1*03:02:01/03:02:03/03:05:01-03:05:02/03:14/03:27/03:29/03:53/03:74/03:81/03:88/03:90/03:102-03:103/03:115/03:122/03:131	DR18(3), -, DR3					5		7											18					
DRB1*03:02:02/03:05:03	DR18(3), DR3					w		7											18					
DRB1*03:03/03:07/03:17/03:21/03:24/03:35/03:40-03:41:02/03:57/03:63/03:101/03:105/03:113/03:119-03:120	DR18(3), DR3, -					5													18					
DRB1*03:08/03:65	-					5	6							13										
DRB1*03:09	-					?		7											?					
DRB1*03:10	DR17(3)					5	6												18	19				
DRB1*03:12	DR3					?	?											?	?					
DRB1*03:38	-					5		7											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
DRB1*03:42/03:87, DRB3*01:34	-						6																22	
DRB1*03:49	-					5			8										18					
DRB1*03:54/03:100:01-03:100:02	-					5	w												18					
DRB1*03:97, DRB1*13:45/13:76/13:197/13:206, DRB1*14:01:01-14:01:04/ 14:05:01-14:05:04/14:07:01-14:08/14:14/14:16/14:22-14:23:04/14:25-14:26/ 14:32:01-14:32:03/14:35-14:36/14:38:01-14:38:02/14:42-14:45/14:49/14:53- 14:54:01/14:54:03-14:56/14:58/14:60/14:62/14:69-14:70/14:72/14:74- 14:75/14:86-14:88/14:90-14:92N/14:96-14:97/14:99/14:101/14:103/14:105/ 14:110/14:112-14:114/14:117-14:119/14:122/14:124/14:126:01-14:126:02/ 14:128-14:131/14:137N/14:139-14:140/14:142/14:146-14:147/14:149- 14:151/14:153/14:155/14:157-14:158/14:160/14:162-14:164/14:166N- 14:168/14:172-14:173/14:175/14:178/14:184	-, DR14(6), DR6, DR13(6), Null																		18	19				
DRB1*03:111, DRB1*09:06	-						6																	
DRB1*03:125, DRB1*13:27/13:176	-, DR13(6)						6									15			18					
DRB1*03:126, DRB1*14:95/14:132	-						6												18	19	20			
DRB1*03:130	-					w		7											w					
DRB1*04:01:01-04:05:11/04:05:13-04:11:03/04:12-04:14/04:16-04:60/ 04:62-04:137/04:139-04:144/04:146-04:153/04:155/04:157N-04:169/04:171- 04:210/04:212N-04:221, DRB1*14:10/14:57/14:143/14:182	DR4, -, Null, DR14(6)								8															
DRB1*04:15/04:61/04:138/04:145/04:154/04:170, DRB1*11:102:01- 11:102:02/11:175	DR4, -								8				13											
DRB1*04:211	-								8													20		
DRB1*07:01:01-07:01:21/07:03-07:76	DR7, -, Null									9														
DRB1*08:01:01-08:01:02/08:01:04-08:01:05/08:02:01-08:04:01/08:04:03- 08:07/08:09-08:19/08:21-08:24:02/08:26-08:28/08:30:01-08:30:03/08:33/ 08:35-08:37/08:39-08:40/08:42-08:46/08:48-08:51/08:54-08:56/08:58-08:62/ 08:64-08:66/08:68/08:70-08:74/08:76-08:79/08:81-08:82, DRB1*14:15	DR8, -, Null										10								18					
DRB1*08:08/08:29, DRB1*14:04:01-14:04:03/14:28/14:31/14:50/14:68:01- 14:68:02/14:71/14:73/14:76/14:79/14:93/14:107/14:120/14:138/14:145/ 14:152N/14:180	-, DR1404, DR14(6), Null										10								18	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
DRB1*08:20/08:67, DRB1*13:07:01-13:09/13:11:01-13:11:02/13:14:01-13:14:03/13:17/13:19/13:22-13:23:02/13:25/13:37/13:44/13:46-13:47/13:50:01/13:52/13:57/13:60/13:62/13:64/13:68/13:70/13:72/13:82-13:84/13:86/13:97:01-13:97:02/13:106-13:107/13:114/13:116/13:132/13:135/13:150/13:172/13:175/13:178/13:180/13:182/13:192/13:204/13:224/13:229/13:231, DRB1*14:20-14:21/14:34/14:37/14:40-14:41/14:77/14:84/14:94/14:100/14:102/14:116/14:123/14:127:01-14:127:02/14:136/14:156/14:159/14:181/14:183	-, DR13(6), DR14(6)																		18					
DRB1*08:25/08:47, DRB1*12:16:01-12:16:03/12:22/12:39	-										10				14				w					
DRB1*08:31, DRB1*11:01:01:01-11:02:02/11:02:04-11:02:05/11:04:01-11:04:12/11:04:14-11:06:03/11:08:01-11:08:03/11:10:01-11:10:02/11:12:01-11:15/11:18-11:19:03/11:21/11:23:01-11:25/11:27:01-11:28:01/11:29:01-11:35/11:37:01-11:39/11:42-11:51/11:56-11:57/11:58:02/11:60-11:62:02/11:64-11:66/11:69-11:70/11:72-11:75/11:77-11:82/11:84:01-11:84:03/11:88/11:90-11:93/11:95-11:101:02/11:104/11:106/11:108-11:109/11:111-11:112/11:114/11:116-11:121/11:124/11:126-11:134/11:137/11:140-11:149/11:152-11:155/11:157-11:158/11:160/11:162-11:166/11:169N-11:171/11:174/11:177-11:181/11:183-11:184/11:186/11:188-11:191/11:194-11:201/11:204-11:207	DR11(5), -, Null													13										
DRB1*08:32/08:53, DRB1*12:46	-										10				14				18					
DRB1*08:34/08:52	-										10								w					
DRB1*08:38	-								8		10								18					
DRB1*08:41/08:63/08:75, DRB1*11:67/11:193:01-11:193:02	-										10			13										
DRB1*08:69	-										10													
DRB1*09:01:02-09:05/09:08/09:10-09:22/09:24-09:30	DR9, -											11												
DRB1*09:07	-											11										21		
DRB1*10:01:01:01-10:11/10:13-10:20	DR10, -												12											
DRB1*11:03:01-11:03:02/11:11:01/11:11:03/11:36/11:41/11:55/11:63:01-11:63:02/11:68/11:76/11:85/11:138-11:139/11:151/11:161/11:168/11:176	DR11(5), -													13		16								
DRB1*11:07:01/11:103:01-11:103:02/11:105/11:107/11:125/11:136/11:173	DR11(5), -					5								13										
DRB1*11:07:02	-					w								13										
DRB1*11:09/11:87	DR11(5), -							7						13	15		17				20			
DRB1*11:16	DR11(5)/DR13(6)													13	15									

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
DRB1*11:17/11:52/11:54:01-11:54:02/11:89/11:150/11:159/11:202, DRB1*14:11	-, DR11(5), DR14(6)													13						19				
DRB1*11:20	DR11(5)							7						13	15									
DRB1*11:22	-								8					?										
DRB1*11:26	DR11(5)													?										
DRB1*11:28:02	-							7						13	15		17				w			
DRB1*11:40	-													?	w	16	w							
DRB1*11:53	-					5								13						19				
DRB1*11:58:01/11:115	-													13	15		17				w			
DRB1*11:59	-						6							13	w	16	w							
DRB1*11:83/11:182	-						6							13	15		17				20			
DRB1*11:113	-													13	15		17				20			
DRB1*11:122	-							7						13	w	16	w							
DRB1*11:135	-						6							13										
DRB1*11:203	-													w										
DRB1*12:01:01:01-12:01:04/12:01:06-12:01:07/12:01:09-12:02:05/12:02:07- 12:03:03/12:05-12:08/12:10-12:15/12:17/12:19/12:21/12:23/12:26-12:30/ 12:32/12:34-12:38/12:40-12:41/12:43-12:45/12:50-12:53/12:55-12:56/12:59- 12:61/12:63-12:64	DR12(5), -, Null														14				w					
DRB1*12:01:05/12:20	-														w				w					
DRB1*12:01:08/12:02:06/12:18/12:33/12:47	-														14									
DRB1*12:04/12:49	-													13	14									
DRB1*12:09/12:24N-12:25/12:48/12:54/12:62	-, Null														14				18					
DRB1*12:58	-														14				w		20			
DRB1*13:01:01:01-13:01:16/13:02:04/13:10/13:15-13:16/13:28/13:35/ 13:40/13:51/13:53/13:59/13:61:01-13:61:02/13:69/13:79-13:80/13:87/ 13:91-13:92/13:98/13:102/13:105/13:110/13:112-13:113N/13:117/13:121/ 13:125/13:127/13:130-13:131/13:137N-13:138/13:141/13:148/13:153/ 13:166/13:173/13:177/13:184-13:187/13:190/13:201/13:205/13:213- 13:215/13:221-13:222/13:226	DR13(6), -, Null															15			18					

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
DRB1*13:02:01-13:02:03/13:02:05-13:02:11/13:02:13/13:31/13:34/13:36/13:39/13:41/13:73-13:74/13:85/13:96:01-13:96:02/13:99/13:104/13:109/13:123-13:124/13:126/13:128/13:140/13:142N-13:143/13:145/13:147/13:155/13:168/13:170/13:171:02/13:198/13:202/13:207-13:212/13:220/13:225	DR13(6), -, Null							7								15		18						
DRB1*13:02:12/13:103/13:165	-							7								15		w						
DRB1*13:03:01-13:04/13:12:01-13:13/13:20-13:21:02/13:24/13:33:01-13:33:03/13:38/13:48-13:49/13:58/13:66:01-13:66:02/13:75/13:78/13:81/13:88-13:90/13:94:01-13:95/13:101/13:108/13:115/13:118/13:122/13:133-13:134/13:149/13:151-13:152/13:154/13:161/13:164/13:167/13:169/13:174/13:194/13:216/13:219/13:227/13:230, DRB1*14:65	DR13(6), -																16	18						
DRB1*13:05:01-13:05:03/13:26:01-13:26:02/13:136/13:158/13:203, DRB1*14:27:01-14:27:02	DR13(6), -, DR14(6)							7								15		17	18		20			
DRB1*13:06/13:146/13:156	DR13(6), -															15		18		20				
DRB1*13:18/13:42	DR13(6)															15		17	18		20			
DRB1*13:29	DR13(6)							7									16	18						
DRB1*13:30/13:55	-																?	?						
DRB1*13:32/13:93	-															15	16		18					
DRB1*13:43/13:188, DRB1*14:169	-																16	18	19					
DRB1*13:50:02-13:50:03/13:189	-							7								15		17	18		w			
DRB1*13:54	DR14(6)																16		w					
DRB1*13:56/13:119, DRB1*14:02:01-14:03:02/14:09/14:30/14:47/14:89/14:115/14:135/14:144/14:174/14:179	-, DR14(6), DR1403							7											18		20			
DRB1*13:63	-							7								w	16	w	18					
DRB1*13:65/13:120/13:139	-							7								15	16		18					
DRB1*13:67	-							7								15								
DRB1*13:71	-						6										16		18					
DRB1*13:77, DRB1*14:177	-																		w		20			
DRB1*13:100/13:162	-																		w					
DRB1*13:111	-															w	16	w	18					
DRB1*13:144	-						6									15		17	18		20			
DRB1*13:157, DRB1*14:67	-							7								15			18		20			
DRB1*13:159/13:171:01/13:179	-							7								15			18	19				
DRB1*13:160/13:218	-															15			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
DRB1*13:163/13:181/13:193, DRB1*14:06:01-14:06:03/14:12:01-14:12:02/ 14:17/14:29/14:52/14:80-14:81/14:83/14:108/14:121/14:165/14:176	-, DR14(6), DR6																		18		20			
DRB1*13:183/13:200N	-, Null															15								
DRB1*13:191/13:217	-															15			18	19				
DRB1*13:196, DRB1*14:24/14:109	-							7											18					
DRB1*13:199	-							7								15		17	w		20			
DRB1*13:223	-															w			18					
DRB1*13:228	-																16							
DRB1*14:13/14:85	DR14(6), -							7									16		18		20			
DRB1*14:18/14:33/14:59/14:64/14:106/14:133/14:154	DR6, -																		18	19	20			
DRB1*14:19	DR14(6)							?											18					
DRB1*14:39/14:54:02/14:61	-																			19				
DRB1*14:46	-							7													20			
DRB1*14:48	-							7											w		20			
DRB1*14:51/14:134	-							7											18	19	20			
DRB1*14:63	-							7								15	16		18		20			
DRB1*14:78	-															15	16		18		20			
DRB1*14:82	-						6												18	19				
DRB1*14:98	-							7											18		w			
DRB1*14:104/14:111	-					w													18	19				
DRB1*14:125	-																		w	w				
DRB1*14:141, DRB3*01:01:02:01-01:07/01:09-01:13/01:15-01:33/01:35- 01:41, DRB3*02:01-02:05/02:07-02:17/02:19/02:21-02:25/02:28-02:46/ 02:48-02:57/02:59-02:61Q, DRB3*03:01:01-03:11	-, DR52, Null																						22	
DRB1*14:148	-										10										19			
DRB1*14:161	-								8										18	19				
DRB1*14:170	-																16		18		20			
DRB1*14:171	-					5													18	19				
DRB1*15:01:01:01-15:01:21/15:01:23-15:20/15:22-15:33/15:35-15:98/ 15:100-15:108/15:110-15:112/15:114/15:116-15:142	DR15(2), -, DR2, Null			3																				
DRB1*15:21, DRB1*16:09:01-16:10/16:33/16:36-16:37	-, DR16(2)			3	4																			
DRB1*15:99/15:109	-			3											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
DRB1*15:113N	Null			w																				
DRB1*16:01:01-16:01:08/16:01:10-16:05:02/16:07/16:11-16:15/16:17-16:26/ 16:28-16:32/16:34-16:35/16:38-16:46	DR16(2), -, DR2, Null				4																			
DRB1*16:01:09	-				w																			
DRB1*16:08	-				4			7								15		17			w			
DRB1*16:16/16:27	-				4									13										
DRB3*01:08, DRB3*02:20	-							7															22	
DRB3*01:14	-					w													w					
DRB3*02:06	-							?															22	
DRB3*02:18	-													13									22	
DRB4*01:01:01-01:01:02/01:03:01-01:01:04/01:06-01:07:02/01:09-01:22/ 01:24-01:26/01:28-01:48, DRB4*02:01N, DRB4*03:01N	DR53, -, Null																							23
DRB4*01:02	-																					?		23
DRB4*01:05/01:08/01:27	DR53, -																							?
DRB4*01:23	-																							w
DRB5*01:01:01-01:12/01:14-01:25/01:27N-01:29, DRB5*02:02-02:16	DR51, -, Null																						21	
DRB5*01:13	-													13									21	
DRB5*01:26	-																					w		

w = weak

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

Table 4: Amplification patterns for all detectable HLA-DQB1* specificities (Lot-No DQB11-2) based on IMGT/HLA Sequence Database Release 3.27.0, January 2017

Allele	Serology	1	2	3	4	5	6	7	8	9	10	11	12
DQB1*02:01:01-02:01:23/02:02:01-02:02:24/02:26-02:34/02:36/02:38-02:39/02:41-02:45/02:48-02:71/02:73-02:88	DQ2, -, Null					5							
DQB1*02:01:24/02:37/02:46-02:47	-					w							
DQB1*03:01:01:01-03:01:01:05/03:01:03-03:01:05/03:01:07-03:01:37/03:09-03:10:02/03:13/03:16/03:19:01-03:19:02/03:21-03:22/03:23:02-03:24/03:27-03:29/03:35/03:42/03:44/03:46-03:53/03:55-03:60/03:69/03:71/03:76-03:77/03:82-03:84N/03:92-03:94/03:101-03:103/03:108-03:109/03:114-03:116/03:119-03:121/03:127-03:128/03:130-03:131/03:133-03:135/03:138-03:140/03:142-03:144/03:147/03:150/03:152/03:154/03:157-03:160/03:163-03:167/03:169-03:170/03:172-03:173/03:180/03:182/03:186-03:188/03:191-03:193/03:195-03:198/03:201-03:202/03:206-03:208/03:216-03:219/03:231-03:232/03:235-03:236/03:241-03:243/03:246/03:253-03:256	DQ7(3), -, DQ8(3), Null						6					11	
DQB1*03:01:02/03:23:01/03:73/03:75/03:118N/03:129/03:162/03:183/03:252	DQ7(3), -, Null						6						
DQB1*03:01:06/03:54	-						6					w	
DQB1*03:02:01:01-03:02:02/03:02:05-03:02:09/03:02:11-03:02:12/03:02:15/03:02:17-03:02:22/03:02:24/03:07/03:11/03:32/03:45/03:62-03:64/03:66N-03:68/03:81/03:85/03:106-03:107/03:125/03:146/03:153/03:161/03:174/03:178/03:184-03:185/03:189-03:190/03:199/03:203/03:205/03:210-03:211/03:213N-03:215/03:220-03:221/03:224/03:229/03:233/03:240/03:245/03:247/03:251	DQ8(3), -, Null								8			11	
DQB1*03:02:03/03:02:23/03:37/03:175/03:223/03:237N, DQB1*06:37/06:139	DQ8(3), -, Null								8				
DQB1*03:02:04/03:02:13/03:204	DQ8(3), -								8			w	
DQB1*03:02:10/03:02:16/03:17:01/03:18/03:110/03:148-03:149/03:225/03:244	-											11	
DQB1*03:02:14	-								w			11	
DQB1*03:03:02:01-03:03:02:04/03:03:04-03:03:13/03:12/03:15/03:25:02-03:26/03:30-03:31/03:33-03:34/03:38-03:41/03:43/03:65/03:74/03:79/03:86-03:91Q/03:95N-03:99Q/03:104-03:105/03:111/03:113/03:117/03:123-03:124/03:126/03:141/03:145/03:155/03:168/03:176-03:177/03:200/03:209/03:212/03:222/03:227/03:230/03:234/03:239/03:248-03:249	DQ9(3), -, Null										10	11	
DQB1*03:03:03/03:06/03:20/03:25:01/03:112/03:136/03:156/03:238, DQB1*04:03:02, DQB1*06:09:04/06:15:01/06:22:01/06:22:03/06:51:01	DQ9(3), DQ3, -										10		
DQB1*03:04:01-03:04:03/03:14:01-03:14:02/03:80	DQ7(3), -						6	7				11	
DQB1*03:05:01-03:05:02/03:61/03:181/03:226/03:250	DQ8(3), -									9			
DQB1*03:05:03-03:05:04	DQ8(3)									9		11	
DQB1*03:08/03:228	-			3					8			11	
DQB1*03:36/03:122/03:151/03:171	-						w					11	
DQB1*03:70	-							7	8			11	
DQB1*03:78	-										w	11	
DQB1*03:132	-									9			12

Allele	Serology	1	2	3	4	5	6	7	8	9	10	11	12
DQB1*03:137	-			3							10	11	
DQB1*03:179	-							w	8			11	
DQB1*03:194	-		2				6					11	
DQB1*04:01:01-04:02:01:03/04:02:03-04:02:07/04:02:09-04:02:12/04:04-04:09/04:11-04:30/04:32-04:39	DQ4, -, Null												12
DQB1*04:03:01	-										10		12
DQB1*04:10	-	w					6						12
DQB1*05:01:01:01-05:01:13/05:01:15/05:01:17-05:01:18/05:01:20-05:03:01:02/05:03:03-05:03:09/05:03:11-05:10/05:11:02-05:20/05:22-05:25/05:27-05:33/05:35-05:43:02/05:45-05:59/05:61-05:71/05:74-05:81/05:83-05:97/05:99-05:104/05:106-05:112/05:114-05:115/05:117-05:127/05:129/05:131-05:143	DQ5(1), -, Null	1											
DQB1*05:01:16/05:01:19/05:26/05:34/05:44/05:113/05:128N/05:130	-, Null	w											
DQB1*05:03:02	DQ5(1)	1					?						
DQB1*05:11:01	-	1										11	
DQB1*06:01:01-06:01:15/06:03:04/06:03:08-06:03:10/06:03:14/06:03:16/06:03:26/06:08:02-06:08:03/06:12/06:14:03/06:17/06:21/06:42-06:43/06:45/06:54N-06:57/06:59/06:64/06:91/06:98-06:105/06:108/06:120/06:132/06:140/06:145/06:157/06:177/06:181/06:190:01-06:190:02/06:194/06:196/06:205/06:209/06:214/06:229	DQ6(1), -, DQ1, Null		2										
DQB1*06:02:01:01-06:02:01:03/06:02:03-06:02:06/06:02:09-06:02:26/06:03:07/06:10-06:11:01/06:13:01-06:13:02/06:14:02/06:16/06:19:01-06:20/06:24/06:33/06:47/06:49-06:50/06:68/06:70-06:81/06:83-06:84/06:95/06:97/06:106-06:107/06:109/06:111-06:117/06:122/06:124-06:127/06:130-06:131/06:136-06:138/06:146:01-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178-06:179N/06:182-06:183/06:188/06:192/06:197-06:198/06:200/06:206:01-06:206:02/06:208/06:211/06:213/06:215-06:216N/06:219/06:224-06:228	DQ6(1), -, DQ1, Null			3									
DQB1*06:02:02	DQ6(1)			3								11	
DQB1*06:02:07/06:03:01/06:03:03/06:03:06/06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:25/06:08:01/06:11:02-06:11:03/06:14:01/06:26N/06:28/06:30-06:31/06:40-06:41/06:44/06:60-06:63/06:67/06:82/06:87/06:90/06:92/06:110/06:128/06:133-06:134/06:141/06:143-06:144N/06:148/06:154/06:165/06:170/06:184-06:185/06:187/06:191/06:195/06:199/06:203/06:210/06:218/06:221-06:223/06:230	-, DQ6(1), DQ1, Null		2	3									
DQB1*06:03:02	DQ6(1)		2	3								11	
DQB1*06:03:05/06:65	-		2	w									
DQB1*06:04:01-06:04:07/06:04:09-06:07:02/06:09:01:01-06:09:03/06:09:05/06:18:01-06:18:02/06:22:02/06:25/06:27:01-06:27:02/06:32:01-06:32:02/06:34/06:36/06:38-06:39/06:52/06:58/06:66/06:69/06:85-06:86/06:88-06:89/06:93-06:94/06:118:01-06:118:02/06:129/06:135/06:155/06:158N/06:160/06:164/06:171-06:172/06:180/06:186/06:189/06:193N/06:202/06:204/06:207/06:217	DQ6(1), -, Null				4								

Allele	Serology	1	2	3	4	5	6	7	8	9	10	11	12
DQB1*06:04:08	-				4							11	
DQB1*06:09:06/06:121/06:212	-				w								
DQB1*06:15:02	-										w		
DQB1*06:23/06:156/06:162/06:169	-	1		3									
DQB1*06:29/06:123	-			3					8				
DQB1*06:35/06:53:01-06:53:02	-		2				6						
DQB1*06:46/06:96/06:119	-			3							10		
DQB1*06:142/06:168	-		2		4								
DQB1*06:149	-		w										
DQB1*06:201	-			w									

w = weak

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