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| Lot No. | DQB12-0 |


CTS Collaborative Transplant Study

WORKING INSTRUCTION

HLA-DQB1*low resolution CTS-PCR-SSP TRAY KIT

LOCUS- AND LOT-SPECIFIC MANUAL

To be applied to the following product:

| Product No. | Description |
|-------------|---|
| 119 | HLA-DQB1* low resolution CTS-PCR-SSP Tray Kit  |

1. Main differences

- Between Lot DQB12-0 (the current lot) and Lot DQB11-2**
 The number of mixes has increased from 13 to 14 (incl. negative control).
 Mix 9 detects DQB1*03:05 (serology DQ8) in addition to DQB1*03:02 (serology DQ8).
 A completely new mix (amplifying DQB1*03:03 / DQ9) was inserted at position 11.
 Alleles which are not sequenced in the primer binding sites of mixes 9 and 11 (according to the IMGT/HLA Database of January 2018) have been excluded from the list of allele specificities of these mixes.
 The kit was updated to cover new alleles included in the IMGT/HLA 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-DQB1 typing of HLA-DQB1 using the PCR-SSP method. All serologically detectable HLA-DQB1 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-DQB1*02:25/02:35/02:40/02:72, DQB1*03:05:02/03:17:02/03:61/03:72/03:100/03:181/03:226/03:262, 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*06:02:08/06:03:19/06:09:04/06:15:01-06:15:02/06:22:01/06:22:03/06:37/06:48/06:51:02/06:69:02/06:118:03/06:153/06:167/06:231/06:247.
 These alleles are considered to be rare.
- This manual is only valid for **Lot No. DQB12-0**.
- 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-DQB1* CTS-PCR-SSP primer mix (Lot No. DQB12-0) based on IMGT/HLA Sequence Database Release 3.31.0, January 2018 | 4 |
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| Table 2: Amplification patterns for all detectable HLA-DQB1* specificities (Lot-No DQB12-0) based on IMGT/HLA Sequence Database Release 3.31.0, January 2018 | 8 |
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4. Kit Composition

- Number of PCR primer mixes per test: 14 (13 allele-specific mixes and 1 negative control mix)
Please note: Wells (positions on tray) B2-A2, B4-A4, B6-A6, B8-A8, B10-A10 and B12-A12 are empty.
- Number of tests per tray: 6
- Number of trays per kit: 10
- The primer mixes are aliquoted and lyophilized in thin-walled, green 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 Table (Table 1) to confirm the correct product size.
- 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.

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 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

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 and 11 amplify 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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Hien Tran, M.D.

13. Appendix

Table 1: Sizes of the PCR products and allele specificities of each HLA-DQB1* CTS-PCR-SSP primer mix (Lot No. DQB12-0) based on IMGT/HLA Sequence Database Release 3.31.0, January 2018

| Position | | Mix | Allele | Serology | Size |
|----------|-----------------|-------|--|----------------------|-----------|
| H1 | H3 H5 H7 H9 H11 | 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/05:131-05:158, 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/05:131-05:158 | DQ5(1), -, Null | 225 bp |
| | | | DQB1*03:194, DQB1*06:01:01:01-06:01:15/06:02:07/06:03:01:01-06:03:06/06:03:08-06:03:18/06:03:20-06:03:27/06:08:01-06:08:03/06:11:02-06:12/06:14:01/06:14:03/06:17/06:21/06:26N/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/06:154/06:157/06:165/06:168/06:170/06:177/06:181/06:184-06:185/06:187/06:190:01-06:191/06:194-06:196/06:199/06:203/06:205/06:209-06:210/06:214/06:218/06:221-06:223/06:229-06:230/06:233-06:234/06:238-06:239/06:243-06:246/06:248 | -, DQ6(1), DQ1, Null | see below |
| G1 | G3 G5 G7 G9 G11 | Mix 2 | DQB1*06:01:01:01-06:01:15/06:35/06:43/06:45/06:53:01-06:57/06:98-06:105/06:108/06:120/06:132/06:140/06:142/06:157/06:168/06:177/06:181/06:194/06:205/06:209/06:214/06:229/06:239/06:243/06:245-06:246 | DQ6(1), -, Null | 160 bp |
| | | | DQB1*03:194, DQB1*06:02:07/06:03:01:01-06:03:06/06:03:08-06:03:18/06:03:20-06:03:27/06:08:01-06:08:03/06:11:02-06:12/06:14:01/06:14:03/06:17/06:21/06:26N/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/06:154/06:165/06:170/06:184-06:185/06:187/06:190:01-06:191/06:195-06:196/06:199/06:203/06:210/06:218/06:221-06:223/06:230/06:233/06:234/06:238/06:244/06:248 | -, DQ6(1), DQ1, Null | 170 bp |

| Position | | Mix | Allele | | Serology | Size |
|----------|-----------------|-------|---|--|-----------------------|-----------|
| F1 | F3 F5 F7 F9 F11 | 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/06:03:06-06:03:07/06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:25/06:03:27/06:08:01/06:10-06:11:03/06:13:01-06:14:02/06:16/06:19:01-06:20/06:23-06:24/06:26N/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/06:182-06:183/06:188/06:192/06:197-06:198/06:200/06:201w/06:206:01-06:206:02/06:208/06:211/06:213/06:215-06:216N/06:219/06:224-06:228/06:232-06:233/06:235-06:237/06:240/06:242/06:249 DQB1*03:08/03:137/03:228, DQB1*06:02:01:01-06:02:06/06:02:09-06:02:28/06:03:07/06:10-06:11:01/06:13:01-06:13:02/06:14:02/06:16/06:19:01-06:20/06:24/06:29/06:33/06:46-06:47/06:49-06:50/06:68/06:70-06:81/06:83-06:84/06:95-06:97/06:106-06:107/06:109/06:111-06:117/06:119/06:122-06:127/06:130-06:131/06:136-06:138/06:146:01-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178-06:179N/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/06:219/06:224-06:228/06:232-06:233/06:235-06:237/06:240/06:242/06:249 | | - , DQ6(1), DQ1, Null | see below |
| | | | DQB1*03:08/03:137/03:228, DQB1*06:02:01:01-06:02:06/06:02:09-06:02:28/06:03:07/06:10-06:11:01/06:13:01-06:13:02/06:14:02/06:16/06:19:01-06:20/06:24/06:29/06:33/06:46-06:47/06:49-06:50/06:68/06:70-06:81/06:83-06:84/06:95-06:97/06:106-06:107/06:109/06:111-06:117/06:119/06:122-06:127/06:130-06:131/06:136-06:138/06:146:01-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178-06:179N/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/06:219/06:224-06:228/06:232-06:233/06:235-06:237/06:240/06:242/06:249 | | - , 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/06:03:07/06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:25/06:03:27/06:08:01/06:10-06:11:03/06:13:01-06:14:02/06:16/06:19:01-06:20/06:23-06:24/06:26N/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/06:67-06:68/06:70-06:84/06:87/06:90/06:92/06:95-06:97/06:106-06:107/06:109-06:117/06:119/06:122-06:127/06:130-06:131/06:136-06:138/06:146:01-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178-06:179N/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/06:219/06:224-06:228/06:232-06:233/06:235-06:237/06:240/06:242/06:249 | | | 105 bp |
| E1 | E3 E5 E7 E9 E11 | Mix 4 | DQB1*06:04:01-06:07:02/06:09:01:01-06:09:03/06:09:05/06:09:06w/06:09:07/06:18:01-06:18:02/06:22:02/06:25/06:27-01-06:27/02/06:32:01-06:32:02/06:34/06:36/06:38-06:39/06:52/06:58/06:66/06:69:01/06:85-06:86/06:88-06:89/06:93-06:94/06:118:01-06:118:02/06:121w/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/06:217/06:241 | | DQ6(1), -, Null | 170 bp |
| D1 | D3 D5 D7 D9 D11 | 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/02:48-02:71/02:73-02:89/02:90w/02:91-02:104 | | DQ2, -, Null | 200 bp |

| Position | | Mix | Allele | | Serology | Size | |
|----------|-----|--------|--------|----|---|------------------------------------|------------------|
| C1 | C3 | Mix 6 | C5 | C7 | DQB1*03:01:01-03:01:12/03:01:14-03:01:39/03:04:01-03:04:03/03:09-03:10:02:02/03:13-03:14:02/03:16/03:19:01-03:19:02/03:21-03:24/03:27-03:29/03:35/03:36w/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/03:172-03:173/03:180/03:182-03:183/03:186-03:188/03:191-03:198/03:201-03:202/03:206-03:208/03:216-03:219/03:231-03:232/03:235-03:236/03:241-03:243/03:246/03:252-03:257/03:260/03:264/03:266-03:268/03:271, DQB1*04:10, DQB1*05:03:02?, DQB1*06:35/06:53:01-06:53:02 | DQ7(3), -, DQ3, Null, DQ5(1) | see below |
| | C9 | | C11 | | | | |
| | C7 | | | | | | |
| | C5 | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| B1 | B3 | Mix 7 | B5 | B7 | DQB1*03:01:01-03:01:12/03:01:14-03:01:39/03:04:01-03:04:03/03:09-03:10:02:02/03:13-03:14:02/03:16/03:19:01-03:19:02/03:21-03:24/03:27-03:29/03:35/03:36w/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/03:172-03:173/03:180/03:182-03:183/03:186-03:188/03:191-03:198/03:201-03:202/03:206-03:208/03:216-03:219/03:231-03:232/03:235-03:236/03:241-03:243/03:246/03:252-03:257/03:260/03:264/03:266-03:268/03:271 | DQ7(3), -, DQ3, Null | 215 bp |
| | B9 | | B11 | | | | |
| A1 | A3 | Mix 8 | A5 | A7 | DQB1*03:23:02/03:217, DQB1*04:10, DQB1*05:03:02? DQB1*03:04:01-03:04:03/03:14:02/03:70/03:80/03:179w, DQB1*06:246w | -, DQ5(1) DQ7(3), - | 120 bp 175 bp |
| | A9 | | A11 | | | | |
| H2 | H4 | Mix 9† | H6 | H8 | DQB1*03:02:01-03:02:09/03:02:12/03:02:21-03:02:24/03:05:01/03:211/03:245/03:247/03:250-03:251/03:263 | DQ8(3), - | 190 bp |
| | H10 | | H12 | | | | |

| Position | | Mix | Allele | | Serology | Size | |
|----------|------------------|---------|---|--|---------------------------|---|--------|
| G2 | G4 G6 G8 G10 G12 | Mix 10 | DQB1*02:03/02:77, DQB1*03:03:02:01-03:03:05/03:03:06w/03:03:07-03:03:15/03:06w/03:12/03:15/03:20/03:25:01w-03:25:02w/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/03:104-03:105/03:111-03:113/03:117/03:123-03:124/03:126w/03:136-03:137/03:141/03:145w/03:155-03:156/03:168/03:176-03:177/03:200/03:209/03:212/03:222/03:227/03:230/03:234/03:238-03:239/03:248-03:249/03:258/03:270, DQB1*04:03:01w-04:03:03w, DQB1*06:03:10/06:51:01/06:66/06:96/06:168/06:172 | | DQ2, -, DQ9(3), DQ3, Null | 135 bp | |
| F2 | F4 F6 F8 F10 F12 | Mix 11† | DQB1*03:03:02:01-03:03:02:05/03:195/03:239/03:248-03:249 | | DQ9(3), - | 177 bp | |
| E2 | E4 E6 E8 E10 E12 | Mix 12 | DQB1*03:01:01-03:01:12/03:01:01:14-03:01:19/03:01:03-03:01:05/03:01:06w/03:01:07-03:02:02/03:02:04w/03:02:05-03:02:12/03:02:13w/03:02:14-03:02:22/03:02:24-03:03:02:05/03:03:04-03:04:03/03:05:03-03:05:04/03:07-03:17:01/03:18-03:19:02/03:21-03:22/03:23-03:24/03:25:02-03:36/03:38-03:53/03:54w/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/03:205-03:222/03:224-03:225/03:227-03:236/03:239-03:249/03:251/03:253-03:261/03:263-03:268/03:269Nw/03:270-03:274, DQB1*05:11:01, DQB1*06:02:02/06:03:02/06:04:08/06:09:07 | | | DQ7(3), -, DQ8(3), DQ9(3), Null, DQ6(1) | 160 bp |
| D2 | D4 D6 D8 D10 D12 | Mix 13 | DQB1*03:132, DQB1*04:01:01-04:02:01:01/04:02:01:04-04:02:01:07/04:02:03-04:02:07/04:02:09-04:03:01/04:04-04:30/04:32-04:42 | | -, DQ4, Null | 210 bp | |
| C2 | C4 C6 C8 C10 C12 | Mix 14 | Negative Control | | | none (440 bp) | |

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

Positions: B2-A2, B4-A4, B6-A6, B8-A8, B10-A10 and B12-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).

† ATTENTION! Alleles which are not sequenced in the primer binding sites of mixes 9 and 11 (according to the IMGT/HLA Database of January 2018) have been excluded from the list of allele specificities of these mixes.

Table 2: Amplification patterns for all detectable HLA-DQB1* specificities (Lot-No DQB12-0) 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 |
|---|----------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|
| DQB1*02:01:01:02:01:23/02:02:01:01:02:02:05/02:04:02:24/02:26:02:34/02:36:02:38-02:39/02:41-02:45/02:48-02:71/02:73-02:76/02:78-02:89/02:91-02:104 | DQ2, -, Null | | | | | 5 | | | | | | | | |
| DQB1*02:01:24/02:37/02:46-02:47/02:90 | - | | | | | w | | | | | | | | |
| DQB1*02:03/02:77 | DQ2, - | | | | | 5 | | | | | 10 | | | |
| DQB1*03:01:01:03:01:01:12/03:01:01:14-03:01:01:19/03:01:03:03:01:05/03:01:07-03:01:39/03:09-03:10/02:02/03:13/03:16/03:19:01-03:19:02/03:21-03:22/03:23:02-03:24/03:27-03:29/03:35/03:42/03:44/03:46-03:53/03:55-03:60/03:69/03:71/03:76-03:77/03:82-03:84N/03:92-03:94/03:101-03:103/03:108-03:109/03:114-03:116/03:119-03:121/03:127-03:128/03:130-03:131/03:133-03:135/03:138-03:140/03:142-03:144/03:147/03:150/03:152/03:154/03:157-03:160/03:163-03:167/03:169-03:170/03:172-03:173/03:180/03:182/03:186-03:188/03:191-03:193/03:196-03:198/03:201-03:202/03:206-03:208/03:216-03:219/03:231-03:232/03:235-03:236/03:241-03:243/03:246/03:253-03:257/03:260/03:264/03:266-03:268/03:271 | DQ7(3), -, DQ3, Null | | | | | 6 | | | | | | | 12 | |
| 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*03:02:01:01:03:02:01:06/03:02:09/03:02:12/03:02:21-03:02:22/03:02:24/03:211/03:245/03:247/03:251/03:263 | DQ8(3), - | | | | | | | | 8 | 9 | | | | |
| DQB1*03:02:02/03:02:05-03:02:08/03:02:11/03:02:14-03:02:15/03:02:17-03:02:20/03:02:25-03:02:26/03:07/03:11/03:32/03:45/03:62-03:64/03:66N-03:68/03:81/03:85/03:106-03:107/03:125/03:146/03:153/03:161/03:174/03:178/03:184-03:185/03:189-03:190/03:199/03:203/03:205/03:210/03:213N-03:215/03:220-03:221/03:224/03:229/03:233/03:240/03:261/03:265/03:273-03:274 | DQ8(3), -, Null | | | | | | | | 8 | | | | | |
| DQB1*03:02:03/03:37/03:175/03:223/03:237N, DQB1*06:139 | DQ8(3), -, Null | | | | | | | | 8 | | | | | |
| DQB1*03:02:04/03:02:13/03:204/03:269N | DQ8(3), -, Null | | | | | | | | 8 | | | | w | |
| DQB1*03:02:10/03:05:03-03:05:04/03:17:01/03:18/03:78/03:110/03:148-03:149/03:244/03:259/03:272 | -, DQ8(3) | | | | | | | | | | | | 12 | |
| DQB1*03:02:16/03:225 | - | | | | | | | | w | | | | 12 | |
| DQB1*03:02:23 | - | | | | | | | | 8 | 9 | | | | |
| DQB1*03:03:02:01-03:03:02:05/03:239/03:248-03:249 | DQ9(3), - | | | | | | | | | | 10 | 11 | 12 | |
| DQB1*03:03:03/03:20/03:112/03:136/03:156/03:238, DQB1*06:51:01 | DQ9(3), - | | | | | | | | | | 10 | | | |
| DQB1*03:03:04-03:03:05/03:07-03:03:15/03:12/03:15/03:26/03:30-03:31/03:33-03:34/03:38-03:41/03:43/03:65/03:74/03:79/03:86-03:91Q/03:95N-03:99Q/03:104-03:105/03:111/03:113/03:117/03:123-03:124/03:141/03:155/03:168/03:176-03:177/03:200/03:209/03:212/03:222/03:227/03:230/03:234/03:258/03:270 | -, Null | | | | | | | | | | 10 | | 12 | |
| DQB1*03:03:06/03:25:02/03:126/03:145 | - | | | | | | | | | | w | | 12 | |
| DQB1*03:04:01-03:04:03/03:14:01-03:14:02/03:80 | DQ7(3), - | | | | | 6 | | 7 | | | | | 12 | |

| Allele | Serology | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|--|----------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|
| DQB1*03:05:01/03:250 | DQ8(3), - | | | | | | | | | 9 | | | | |
| DQB1*03:06/03:25:01, DQB1*04:03:02-04:03:03 | DQ3, - | | | | | | | | | | w | | | |
| DQB1*03:08/03:228 | - | | | 3 | | | | | 8 | | | | 12 | |
| DQB1*03:36/03:122/03:151/03:171 | - | | | | | w | | | | | | | 12 | |
| DQB1*03:70 | - | | | | | | | 7 | 8 | | | | 12 | |
| DQB1*03:132, DQB1*04:01:01-04:02:01:01/04:02:01-04:04:02:01:07/04:02:03-04:02:07/04:02:09-04:02:14/04:04-04:09/04:11-04:30/04:32-04:42 | -, DQ4, Null | | | | | | | | | | | | | 13 |
| DQB1*03:137 | - | | | 3 | | | | | | | 10 | | 12 | |
| DQB1*03:179 | - | | | | | | | w | 8 | | | | 12 | |
| DQB1*03:194 | - | | 2 | | | | 6 | | | | | | 12 | |
| DQB1*03:195 | - | | | | | | 6 | | | | | 11 | 12 | |
| DQB1*04:03:01 | - | | | | | | | | | | w | | | 13 |
| DQB1*04:10 | - | w | | | | | 6 | | | | | | | 13 |
| DQB1*05:01:01-05:01:13/05:01:15/05:01:17-05:01:18/05:01:20-05:03:01:03/05:03:03-05:03:09/05:03:11-05:10/05:11:02-05:20/05:22-05:25/05:27-05:33/05:35-05:43:02/05:45-05:59/05:61-05:71/05:74-05:81/05:83-05:97/05:99-05:104/05:106-05:112/05:114-05:115/05:117-05:127/05:129/05:131-05:158 | 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 | | | | | | | | | | | 12 | |
| DQB1*06:01:01-06:01:15/06:03:04/06:03:08-06:03:09/06:03:14/06:03:16/06:03:26/06:08:02-06:08:03/06:12/06:14:03/06:17/06:21/06:42-06:43/06:45/06:54N-06:57/06:59/06:64/06:91/06:98-06:105/06:108/06:120/06:132/06:140/06:145/06:157/06:177/06:181/06:190:01-06:190:02/06:194/06:196/06:205/06:209/06:214/06:229/06:239/06:243/06:245 | DQ6(1), -, DQ1, Null | | 2 | | | | | | | | | | | |
| DQB1*06:02:01-06:02:01-04/06:02:03-06:02:06/06:02:09-06:02:28/06:03:07/06:10-06:11:01/06:13:01-06:13:02/06:14:02/06:16/06:19:01-06:20/06:24/06:33/06:46-06:47/06:49-06:50/06:68/06:70-06:81/06:83-06:84/06:95/06:97/06:106-06:107/06:109/06:111-06:117/06:119/06:122/06:124-06:127/06:130-06:131/06:136-06:138/06:146:01-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178-06:179N/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/06:219/06:224-06:228/06:232/06:235-06:237/06:240/06:242/06:249 | DQ6(1), -, DQ1, Null | | | 3 | | | | | | | | | | |
| DQB1*06:02:02 | DQ6(1) | | | 3 | | | | | | | | | 12 | |

| Allele | Serology | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|-----------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|
| DQB1*06:02:07/06:03:01:01-06:03:01:02/06:03:03/06:03:06/06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:25/06:03:27/06:08:01/06:11:02-06:11:03/06:14:01/06:26N/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/06:148/06:154/06:165/06:170/06:184-06:185/06:187/06:191/06:195/06:199/06:203/06:210/06:218/06:221-06:223/06:230/06:233-06:234/06:238/06:244/06:248 | - , DQ6(1), DQ1, Null | | 2 | 3 | | | | | | | | | | |
| DQB1*06:03:02 | DQ6(1) | | 2 | 3 | | | | | | | | | 12 | |
| DQB1*06:03:05/06:65 | - | | 2 | w | | | | | | | | | | |
| DQB1*06:03:10 | - | | 2 | | | | | | | | 10 | | | |
| DQB1*06:04:01-06:04:07/06:04:09-06:07:02/06:09:01:01-06:09:03/06:09:05/06:18:01-06:18:02/06:22:02/06:25/06:27:01-06:27:02/06:32:01-06:32:02/06:34/06:36/06:38-06:39/06:52/06:58/06:69:01/06:85-06:86/06:88-06:89/06:93-06:94/06:118:01-06:118:02/06:129/06:135/06:155/06:158N/06:160/06:164/06:171/06:180/06:186/06:189/06:193N/06:202/06:204/06:207/06:217/06:241 | DQ6(1), -, Null | | | | 4 | | | | | | | | | |
| DQB1*06:04:08/06:09:07 | - | | | | 4 | | | | | | | | 12 | |
| DQB1*06:09:06/06:121/06:212 | - | | | | w | | | | | | | | | |
| DQB1*06:23/06:156/06:162/06:169 | - | 1 | | 3 | | | | | | | | | | |
| DQB1*06:29/06:123 | - | | | | | | | | 8 | | | | | |
| DQB1*06:35/06:53:01-06:53:02 | - | | 2 | | | | 6 | | | | | | | |
| DQB1*06:66/06:172 | - | | | | 4 | | | | | | 10 | | | |
| DQB1*06:96 | - | | | 3 | | | | | | | 10 | | | |
| DQB1*06:142 | - | | 2 | | 4 | | | | | | | | | |
| DQB1*06:149 | - | | w | | | | | | | | | | | |
| DQB1*06:168 | - | | 2 | | 4 | | | | | | 10 | | | |
| DQB1*06:201 | - | | | | | | | | | | | | | |
| DQB1*06:246 | - | | 2 | | | | | w | 8 | | | | | |

w = weak

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

ATTENTION! Alleles which are not sequenced in the primer binding sites of mixes 9 and 11 (according to the IMGT/HLA Database of January 2018) have been excluded from the list of allele specificities of these mixes.