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Manual No.	19
Revision	May 23, 2016
Product No.	119
Lot No.	DQB11-1


**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**

- **Attention:**  
 All CTS-PCR-SSP Kits (for both, HLA class I and HLA class II typing) can be used with the new "Mastermix SSP" as PCR buffer. There is no change in the Mastermix volume to be used for setting up the PCR reaction. Taq polymerase is also required as previously.
- **Between Lot DQB11-1 (the current lot) and Lot DQB11-0:**  
 The kit was updated to cover new alleles included in the IMGT/HLA Database of January 2016. 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 3.23.0, January 2016, except HLA-DQB1\*02:25/02:35/02:40, 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
- Those alleles are considered to be rare and can be detected e. g. by sequencing with the CTS-SEQUENCE KIT (you may contact us for further information).
- This manual is only valid for **Lot No. DQB11-1**.
- 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).

### 3. Content

1. Main differences .....	1
2. Introduction .....	1
3. Content .....	2
4. Kit Composition .....	3
5. Materials, Reagents and Equipment not supplied .....	3
6. Sample Requirements, PCR and Gel Electrophoresis .....	3
7. Result Evaluation .....	3
8. Interpretation Hints .....	3
9. Special notes .....	3
10. Troubleshooting .....	3
11. Precaution .....	3
12. Contact .....	3
13. Appendix .....	4

<b>Table 1:</b> Sizes of the PCR products and allele specificities of each <b>HLA-DQB1*</b> CTS-PCR-SSP primer mix ( <b>Lot No. DQB11-1</b> ) based on IMGT/HLA Sequence Database Release 3.23.0, January 2016 .....	4
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<b>Table 2:</b> Amplification patterns for all detectable <b>HLA-DQB1*</b> specificities ( <b>Lot-No DQB11-1</b> ) based on IMGT/HLA Sequence Database Release 3.23.0, January 2016 .....	7
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#### 4. Kit Composition

- Number of PCR primer mixes per test: 13 (12 allele-specific mixes and 1 negative control mix)  
Please note: Wells (positions on tray) C2-A2, C4-A4, C6-A6, C8-A8, C10-A10 and C12-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](http://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 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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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. DQB11-1**) based on IMGT/HLA Sequence Database Release 3.23.0, January 2016

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/05:35-05:43/05:44w/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/05:114-05:115/05:117-05:119, DQB1*06:23/06:156/06:162/06:169	-, DQ5(1), Null	see below
							DQB1*04:10w, DQB1*05:03:02, 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/05:35-05:43/05:44w/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/05:114-05:115/05:117-05:119	DQ5(1), -, Null	225 bp
G1	G3	G5	G7	G9	G11	Mix 2	DQB1*03:194, DQB1*06:01:01:01-06:01:15/06:02:07/06:03:01-06:03:06/06:03:08-06:03:18/06:03:20-06:03:22/06:08:01-06:08:03/06:11:02-06:12/06:14:01/06:14:03/06:17/06:21/06:26N/06:28/06:30-06:31/06:35/06:40-06:45/06:53-06:57/06:59-06:65/06:67/06:82/06:87/06:90-06:92/06:98-06:105/06:108/06:110/06:120/06:128/06:132-06:134/06:140-06:145/06:148/06:149w/06:154/06:157/06:165/06:168/06:170/06:177/06:181/06:184-06:185/06:187/06:190-06:191/06:194-06:196/06:199	-, DQ6(1), DQ1, Null	see below
							DQB1*06:01:01:01-06:01:15/06:35/06:43/06:45/06:53-06:57/06:98-06:105/06:108/06:120/06:132/06:140/06:142/06:157/06:168/06:177/06:181/06:194	DQ6(1), -, Null	160 bp
							DQB1*03:194, DQB1*06:02:07/06:03:01-06:03:06/06:03:08-06:03:18/06:03:20-06:03:22/06:08:01-06:08:03/06:11:02-06:12/06:14:01/06:14:03/06:17/06:21/06:26N/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/06:154/06:165/06:170/06:184-06:185/06:187/06:190-06:191/06:195-06:196/06:199	-, DQ6(1), DQ1, Null	170 bp
F1	F3	F5	F7	F9	F11	Mix 3	DQB1*03:08/03:137, DQB1*06:02:01-06:02:07/06:02:09-06:03:03/06:03:05w/06:03:06-06:03:07/06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:22/06:08:01/06:10-06:11:03/06:13:01-06:14:02/06:16/06:19:01-06:20/06:23-06:24/06:26N/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	-, DQ6(1), DQ1, Null	see below
							DQB1*03:08/03:137, DQB1*06:02:01-06:02:06/06:02:09-06:02:25/06:03:07/06:10-06:11:01/06:13:01-06:13:02/06:14:02/06:16/06:19:01-06:20/06:24/06:29/06:33/06:46-06:47/06:49-06:50/06:68/06:70-06:81/06:83-06:84/06:95-06:97/06:106-06:107/06:109/06:111-06:117/06:119/06:122-06:127/06:130-06:131/06:136-06:138/06:146:01-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178-06:179N/06:182-06:183/06:188/06:192/06:197-06:198/06:200	-, DQ6(1), DQ1, Null	165 bp

Position						Mix	Allele	Serology	Size
							DQB1*06:02:01-06:02:04/06:02:06-06:02:07/06:02:09-06:02:15/06:02:17-06:02:18/06:02:20-06:03:03/ 06:03:05w/06:03:06-06:03:07/06:03:11-06:03:13/06:03:15/06:03:17-06:03:18/06:03:20-06:03:22/06:08:01/ 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	DQ6(1), -, DQ1, Null	105 bp
E1	E3	E5	E7	E9	E11	Mix 4	DQB1*06:04:01-06:07:02/06:09:01-06:09:03/06:09:05/06:09:06w/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	DQ6(1), -, Null	170 bp
D1	D3	D5	D7	D9	D11	Mix 5	DQB1*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/02:48-02:65	DQ2, -, Null	200 bp
C1	C3	C5	C7	C9	C11	Mix 6	DQB1*03:01:01:01-03:01:31/03:04:01-03:04:02/03:09-03:10:02/03:13-03:14:02/03:16/03:19/03:21-03:24/ 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, DQB1*04:10, DQB1*05:03:02?, DQB1*06:35/ 06:53	DQ7(3), -, DQ3, Null, DQ5(1)	see below
							DQB1*03:01:01:01-03:01:31/03:04:01-03:04:02/03:09/03:13/03:16/03:19/03:21-03:22/03:24/03:27-03:29/ 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, DQB1*06:35/06:53	DQ7(3), -, Null	100 bp
							DQB1*03:01:01:01-03:01:31/03:04:01-03:04:02/03:09-03:10:02/03:13-03:14:02/03:16/03:19/03:21-03:22/ 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	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
B1	B3	B5	B7	B9	B11	Mix 7	DQB1*03:04:01-03:04:02/03:14:01-03:14:02/03:70/03:80/03:179w	DQ7(3), -	175 bp

Position						Mix	Allele	Serology	Size
A1	A3	A5	A7	A9	A11	Mix 8	<b>DQB1*03:02:01-03:02:09/03:02:11-03:02:13/03:02:14w/03:02:15/03:02:17-03:02:19/03:07-03:08/03:11/03:32/03:37/03:45/03:62-03:64/03:66N-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, DQB1*06:29/06:37/06:123/06:139</b>	DQ8(3), -, Null	See below
							DQB1*03:02:01-03:02:09/03:02:11-03:02:13/03:02:14w/03:02:15/03:02:17-03:02:19/03:07-03:08/03:11/03:32/03:37/03:45/03:62-03:64/03:66N-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, DQB1*06:29/06:123/06:139	DQ8(3), -, Null	130 bp
							DQB1*06:37	-	145 bp
H2	H4	H6	H8	H10	H12	Mix 9	DQB1*03:05:01-03:05:04/03:61/03:132/03:181	DQ8(3), -	135 bp
G2	G4	G6	G8	G10	G12	Mix 10	<b>DQB1*03:03:02:01-03:03:13/03:06/03:12/03:15/03:20/03:25-03:26/03:30-03:31/03:33-03:34/03:38-03:41/03:43/03:65/03:74/03:78w/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, 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</b>	DQ9(3), -, DQ3, Null	see below
							DQB1*03:03:02:01-03:03:13/03:06/03:12/03:15/03:20/03:25-03:26/03:30-03:31/03:33-03:34/03:38-03:41/03:43/03:65/03:74/03:78w/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, 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
F2	F4	F6	F8	F10	F12	Mix 11	DQB1*03:01:01:01-03:01:01:03/03:01:03-03:01:05/03:01:06w/03:01:07-03:02:02/03:02:04w/03:02:05-03:02:12/03:02:13w/03:02:14-03:03:02:04/03:03:04-03:04:02/03:05:03-03:05:04/03:07-03:17:01/03:18-03:19/03:21-03:22/03:23-02:24/03:26-03:36/03:38-03:53/03:54w/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/03:205-03:221, 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
E2	E4	E6	E8	E10	E12	Mix 12	DQB1*03:132, DQB1*04:01:01-04:02:01/04:02:03-04:02:07/04:02:09-04:03:01/04:04-04:30/04:32-04:33	-, DQ4, Null	210 bp
D2	D4	D6	D8	D10	D12	Mix 13	Negative control		None (440 bp)

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

**Positions:** C2-A2, C4-A4, C6-A6, C8-A8, C10-A10 and C12-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 2:** Amplification patterns for all detectable HLA-DQB1\* specificities (Lot-No DQB11-1) based on IMGT/HLA Sequence Database Release 3.23.0, January 2016

Allele	Serology	1	2	3	4	5	6	7	8	9	10	11	12
DQB1*02:01:01-02:24/02:26-02:34/02:36/02:38-02:39/02:41-02:45/02:48-02:65	DQ2, -, Null					5							
DQB1*02:37/02:46-02:47	-					w							
DQB1*03:01:01:01-03:01:01:03/03:01:03-03:01:05/03:01:07-03:01:31/03:09-03:10:02/03:13/03:16/03:19/03:21-03:22/03:23-02:24/03:27-03:29/03:35/03:42/03:44/03:46-03:53/03:55-03:60/03:69/03:71/03:76-03:77/03:82-03:84N/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	DQ7(3), -, DQ3, Null						6					11	
DQB1*03:01:02/03:23:01/03:73/03:75/03:118N/03:129/03:162/03:183	DQ7(3), -, Null						6						
DQB1*03:01:06/03:54	-						6					w	
DQB1*03:02:01-03:02:02/03:02:05-03:02:09/03:02:11-03:02:12/03:02:15/03:02:17-03:02:19/03:07/03:11/03:32/03:45/03:62-03:64/03:66N-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	DQ8(3), -, Null								8			11	
DQB1*03:02:03/03:37/03:175, DQB1*06:37/06:139	DQ8(3), -								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	-											11	
DQB1*03:02:14	-								w			11	
DQB1*03:03:02:01-03:03:02:04/03:03:04-03:03:13/03:12/03:15/03:26/03:30-03:31/03:33-03:34/03:38-03:41/03:43/03:65/03:74/03:79/03:86-03:91Q/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	DQ9(3), -, Null										10	11	
DQB1*03:03:03/03:06/03:20/03:25/03:112/03:136/03:156, 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*03:04:01-03:04:02/03:14:01-03:14:02/03:80	DQ7(3), -						6	7				11	
DQB1*03:05:01-03:05:02/03:61/03:181	DQ8(3), -									9			
DQB1*03:05:03-03:05:04	DQ8(3)									9		11	
DQB1*03:08	-			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
DQB1*03:137	-			3							10	11	
DQB1*03:179	-							w	8			11	

Allele	Serology	1	2	3	4	5	6	7	8	9	10	11	12
DQB1*03:194	-		2				6					11	
DQB1*04:01:01-04:02:01/04:02:03-04:02:07/04:02:09-04:02:10/04:04-04:09/04:11-04:30/04:32-04:33	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/ 05:03:11-05:10/05:11:02-05:20/05:22-05:25/05:27-05:33/05:35-05:43/05:45-05:59/05:61-05:71/ 05:74-05:81/05:83-05:97/05:99-05:104/05:106-05:112/05:114-05:115/05:117-05:119	DQ5(1), -, Null	1											
DQB1*05:01:16/05:01:19/05:26/05:34/05:44/05:113	-	w											
DQB1*05:03:02	DQ5(1)	1					?						
DQB1*05:11:01	-	1										11	
DQB1*06:01:01-06:01:15/06:03:04/06:03:08-06:03:10/06:03:14/06:03:16/06:08:02-06:08:03/06:12/ 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/ 06:120/06:132/06:140/06:145/06:157/06:177/06:181/06:190/06:194/06:196	DQ6(1), -, DQ1, Null		2										
DQB1*06:02:01/06:02:03-06:02:06/06:02:09-06:02:25/06:03:07/06:10-06:11:01/06:13:01-06:13:02/ 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- 06:138/06:146-06:147/06:150-06:152/06:159/06:161/06:163/06:166/06:173-06:176/06:178- 06:179N/06:182-06:183/06:188/06:192/06:197-06:198/06:200	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/ 06:03:20-06:03:22/06:08:01/06:11:02-06:11:03/06:14:01/06:26N/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	-, DQ6(1), DQ1, Null		2	3									
DQB1*06:03:02	DQ6(1)		2	3								11	
DQB1*06:03:05/06:65	-		2	w									
DQB1*06:04:01-06:04:07/06:04:09-06:07:02/06:09:01-06:09:03/06:09:05/06:18:01-06:18:02/ 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	DQ6(1), -, Null				4								
DQB1*06:04:08	-				4							11	
DQB1*06:09:06/06:121	-				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	-		2				6						



Allele	Serology	1	2	3	4	5	6	7	8	9	10	11	12
DQB1*06:46/06:96/06:119	-			3							10		
DQB1*06:142/06:168	-		2		4								
DQB1*06:149	-		w										

w = weak

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