HLA-A-B-DR-DQ Combi Tray Lot No: 2R6 Expiry Date: 2026-10-01

(101.708-24/24u)

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sample ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DNA Conc.(ng/ul):\_\_\_\_\_\_\_\_\_\_

Test Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tested By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Review Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reviewed By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Interpretation:\_\_\_\_\_\_\_\_\_\_\_ Failed lanes: \_\_\_\_\_\_\_\_\_\_\_ Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

**Gel Picture**

|  |
| --- |
| PHOTO DOCUMENT |

**HLA-A LOW RESOLUTION**



**HLA-B LOW RESOLUTION**





**HLA-DR LOW RESOLUTION**

**HLA-DQ LOW RESOLUTION**



Abbreviations

ICB: Internal Control Band

AmpS: Amplicon Size

**Notes:**

Product sizes are approximate. For detailed information, see the lot-specific Specificity Table and Interpretation Table.

This table is intended as a guide. For interpretation always use the Interpretation Table and/or Specificity Table.

**HLA-A low resolution primer set**

The A\*23:66, 23:99, A\*24:14:01:01-24:15, 24:51-24:53, 24:57, 24:64, 24:94, 24:114, 24:138, 24:188, 24:222N, 24:228, 24:291, 24:296, 24:304, 24:316, 24:324, 24:412, 24:481, 24:515 and 24:574 alleles will not be amplified by this lot of A-B-DR-DQ. These alleles can e.g. be amplified by the HLA-A low resolution kit and/or the A-B-DR resolution kit.

HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

Primer mixes 8 and 9 may weakly amplify the A\*34 alleles.

Primer mix 14 may give rise to a lower yield of HLA-specific PCR product than the other HLA-A low primer mixes.

Primer mix 3 may faintly amplify the A\*30:04:01:01-30:04:01:02, 30:04:02-30:04:03, 30:06, 30:09:01:01-30:09:01:02, 30:17, 30:29, 30:46, 30:77, 30:89-30:90, 30:99, 30:103, 30:105, 30:117, 30:139, 30:150, 30:155, 30:160 and 30:183 alleles.

Primer mixes 9, 10, 13, 14, 19 and 21 may have a tendency of giving rise to primer oligomer formation.

Primer mixes 3, 14, 16 and 19 may have tendency of unspecific amplification.

Primer mixes 19 and 20 may generate a false positive band of about 560 base pairs. This band should be disregarded when interpreting HLA-A low resolution typings.

**HLA-B low resolution primer set**

HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

Primer mix 25 may give rise to a lower yield of HLA-specific PCR product than the other HLA-B low resolution primer mixes in B\*40, B\*41, B\*45, B\*49 and B\*50 alleles.

Primer mixes 25, 26, 30, 38, 48, 57 and 62 may give rise to a lower yield of HLA-specific PCR product than the other HLA-B low resolution primer mixes.

Primer mixes 23, 29, 30, 34, 38, 56 and 63 may have tendencies of unspecific amplifications, most pronounced in primer mix 30.

Primer mixes 22, 24, 25, 39, 40, 41, 59 and 62 have a tendency giving rise to primer oligomer formation.

The B\*15, B\*46, B\*57, B\*58 and C\*03 alleles may be faintly amplified by primer mix 30.

Primer mix 57 may give rise to a lower yield of B\*54 alleles than the other B low primer mixes.

The C\*17 alleles might be faintly amplified by primer mix 45.

The Bw4-associated HLA-A specificities A23, A24, A2403, A25 and A32 are not amplified by the primer pair in primer mix 63.

**DR low resolution primer set**

HLA-specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.

Primer mixes 65, 72, 76, 79, 80 and 82 to 86 have a tendency giving rise to primer oligomer formation.

Primer mix 67, 68, 72, 73 and 84 may have a tendency for unspecific amplification.

Primer mix 83 has a tendency of primer oligomer formation and also has an intense primer cloud due to the high number of primers present in the primer mix.

Due to sharing of sequence motifs in codon 38 and 47, DRB3\*01:14 will also be amplified in primer mixes 69, 70 and 81, and DRB3\*01:23 and 02:32 in primer mix 69, in addition to primer mix 85.

Primer mix 75 may give rise to a lower yield of HLA-specific PCR product than the other DR low resolution primer mixes.

**DQ low resolution primer set**

HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

Primer mixes 89 and 90 have a tendency to give rise to primer oligomer formation.

Primer mixes 91 to 95 may give rise to a lower yield of HLA-specific PCR product than the other DQ low resolution primer mixes.

Primer mixes 93 and 94 may have tendencies of unspecific amplifications.

Primer mix 96 contains a negative control, which will amplify the majority of HLA amplicons as well as the amplicons generated by the control primer pairs matching the human growth hormone gene. HLA-specific PCR product sizes range from 75 to 200 base pairs and the PCR product generated by the HGH positive control primer pair is 200 base pairs.

**HLA-A low resolution Interpretation Table**









**1**HLA-A, HLA-B, HLA-DRB and HLA-DQB1 alleles listed on the IMGT/HLA web page 2022-July-12, release 3.49.0, [www.ebi.ac.uk/imgt/hla](http://www.ebi.ac.uk/imgt/hla).

**2**Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

**3**The serological reactivity of all HLA-A alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

**4**The A\*36 alleles will give rise to identical amplification patterns as a number of A\*01 alleles. These alleles can be separated by the A\*01 and A\*36 high resolution SSP primer sets.

**5**The HLA-A alleles will be grouped into their corresponding serological specificities, except that the following alleles give rise to identical amplification patterns:

|  |  |
| --- | --- |
| Alleles | Alleles |
| A\*01:26, 01:136, 01:192, 01:380:01:01-01:380:01:02, A\*11:94, 11:112, 11:211, 11:226, 11:290, 11:326 | A\*23:01:01:01-23:10:02, 23:12-23:13, 23:15-23:56, 23:58-23:63, 23:65, 23:67-23:68, 23:70-23:98, 23:100-23:103N, 23:106N-23:112, 23:114-23:124, B\*18:27 |
| A\*01:28, 01:229, 01:299, A\*11:282 | A\*23:11N, A\*31:29, 31:85 |
| A\*01:43, A\*11:271 | A\*23:14:01-23:14:02, 23:104-23:105, A\*24:24, 24:71, 24:315, 24:392, 24:527, 24:569 |
| A\*03:01:23, 03:01:83, 03:01:94, 03:08:01:01-03:08:01:02, 03:36N, 03:57, 03:59, 03:72, 03:89:02, 03:107-03:108, 03:111, 03:142, 03:172-03:173, 03:176, 03:178N, 03:198-03:199, 03:203, 03:205, 03:211, 03:252, 03:267, 03:330N, 03:398, 03:413, A\*24:92, 24:458, 24:551, 24:557 | A\*25:78, 26:57, A\*66:12, 66:15 |
| A\*03:187, 03:215, 03:225, 03:249, 03:322, 03:414, A\*25:46, 25:77, 25:81-25:82 | A\*26:92, A\*66:42 |
| A\*11:01:01:01-11:02:07, 11:04-11:07:01, 11:08-11:09, 11:12:01-11:16, 11:18-11:19, 11:21N-11:24:02, 11:26-11:27, 11:29-11:39, 11:41-11:52Q, 11:54:01-11:59, 11:61-11:93, 11:95-11:111, 11:114-11:115N, 11:117-11:129, 11:131-11:138, 11:141-11:157, 11:159-11:161, 11:163-11:165, 11:167-11:174, 11:176-11:182Q, 11:184-11:190, 11:192-11:198, 11:200-11:208:02N, 11:210N, 11:212-11:221, 11:224-11:225, 11:227-11:268, 11:270, 11:272Q-11:281, 11:283-11:289, 11:291-11:305, 11:307-11:325, 11:327-11:347N, 11:349-11:365N, 11:367-11:371, 11:373-11:380, 11:382N-11:428, A\*24:555 | A\*30:01:01:01-30:04:04, 30:06-30:07, 30:09:01:01-30:12:02, 30:14L-30:15, 30:17-30:20, 30:23-30:43, 30:45, 30:47-30:54, 30:56-30:88, 30:90-30:124, 30:126-30:139, 30:141-30:149, 30:151-30:162, 30:164-30:176, 30:178N-30:185, 30:187-30:203, B\*07:260, C\*12:328 |
| A\*11:11, A\*34:19 | A\*31:08, 31:109, A\*33:53, 33:125, 33:131 |
| A\*11:116, 11:140, 11:199:01-11:199:02, 11:222, A\*66:23 | A\*34:01:01:01-34:01:07, 34:05-34:06, 34:11-34:12, 34:14, 34:16-34:18, 34:23, 34:27, A\*66:40 |

6The A\*23:66, 23:99, A\*24:14:01:01-24:15, 24:51-24:53, 24:57, 24:64, 24:94, 24:114, 24:138, 24:188, 24:222N, 24:228, 24:291, 24:296, 24:304, 24:316, 24:324, 24:412, 24:481, 24:515 and 24:574 alleles will not be amplified by this lot of A-B-DR-DQ. These alleles can e.g. be amplified by the HLA-A low resolution kit and/or the A-B-DR low resolution kit.

Abbreviations

w: might be weakly amplified

**HLA-B low resolution Interpretation Table**

























































HLA-B, HLA-DRB and HLA-DQB1 alleles listed on the IMGT/HLA web page 2022-July-12, release 3.49.0, [www.ebi.ac.uk/imgt/hla.](http://www.ebi.ac.uk/imgt/hla)

**2**Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

**3**The serological reactivity of all HLA-B alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

**4**The HLA-B alleles will be grouped into their corresponding serological specificities, except that the following alleles give rise to identical amplification patterns:

|  |  |
| --- | --- |
| Alleles | Alleles |
| B\*07:174, 07:202, 07:222, 07:279, B\*81:02:01-81:02:02 | B\*51:104:01, 51:118N, 51:147, 51:267, 51:284, B\*52:73, B\*58:08:01-58:08:02 |
| B\*07:349, B\*42:05:01-42:05:02 | B\*51:310, B\*52:88, B\*53:28 |
| B\*08:26:01-08:26:02, 08:50, 08:62, 08:85, 08:94, 08:242, 08:263, 08:265, 08:272, 08:299, B\*42:07, 42:24, 42:26 | B\*53:30, B\*58:111 |
| B\*13:04, 13:10, 13:35, 13:59, 13:71-13:72, 13:108, 13:127, 13:140, 13:160, B\*44:135, 44:158, 44:184 | B\*53:39, B\*57:128, B\*58:100 |
| B\*14:08:01-14:08:02, 14:55, B\*39:01:35, 39:30, 39:32-39:33, 39:43, 39:47, 39:50, 39:74, 39:82, 39:102, 39:107, 39:112, 39:128, 39:136, 39:169, 39:171, 39:174 | B\*55:01:07, 55:02:01:01-55:02:10, 55:02:12-55:02:16, 55:07, 55:10, 55:12-55:13, 55:16, 55:19, 55:23, 55:26-55:27, 55:30, 55:32, 55:35, 55:37, 55:39, 55:41-55:43, 55:46-55:48, 55:50, 55:57, 55:61-55:63, 55:65, 55:67, 55:69-55:72, 55:77, 55:80-55:83N, 55:88-55:89N, 55:96, 55:107, 55:112, 55:117N, 55:120, 55:128-55:129, B\*56:10, 56:66 |
| B\*18:29, 18:72:01-18:72:03, 18:92, 18:175, B\*35:01:55, 35:01:62, 35:31-35:32:03, 35:37, 35:53N, 35:64:01-35:64:02, 35:68:01-35:68:02, 35:75, 35:99, 35:118-35:119, 35:127, 35:151:01-35:151:02, 35:174, 35:205:01-35:205:03, 35:234-35:235, 35:251:02, 35:273, 35:292, 35:367, 35:369, 35:409, 35:433, 35:521, 35:523, 35:535 | B\*55:04, 55:08, 55:49, 55:86, B\*56:01:05, 56:01:13, 56:15, 56:18-56:19N, 56:22, 56:31-56:32, 56:50 |
| B\*35:01:56, 35:191, B\*58:64 | B\*56:13, B\*82:04 |
| B\*35:63, 35:317, B\*40:129 | B\*57:01:01:01-57:01:04, 57:01:06-57:01:22, 57:01:24-57:01:31, 57:01:33-57:01:44, 57:01:46-57:03:05, 57:05-57:06, 57:08, 57:10, 57:15-57:20, 57:22-57:23, 57:25, 57:27-57:30, 57:32-57:35, 57:37-57:44, 57:46, 57:48-57:50, 57:52-57:58, 57:60-57:68, 57:70, 57:72-57:81, 57:84-57:87, 57:90-57:92, 57:94-57:108, 57:110-57:117, 57:120-57:127, 57:129-57:144, 57:146, 57:148-57:160, 57:162N, B\*58:36 |
| B\*40:496, B\*41:62 | B\*57:01:23, 57:01:45, 57:36, 57:89, 57:109, B\*58:01:01:01-58:01:02, 58:01:04-58:01:15, 58:01:17-58:01:42, 58:04-58:05, 58:10N-58:15, 58:19, 58:21-58:24, 58:28:01-58:29, 58:31N-58:35, 58:37, 58:39N-58:42, 58:45:01-58:45:02, 58:47-58:59:02, 58:62-58:63, 58:65-58:72N, 58:74-58:75, 58:77, 58:79-58:83, 58:85-58:93N, 58:95-58:99, 58:101-58:103, 58:105-58:107, 58:109-58:110, 58:112-58:113, 58:115-58:120, 58:123-58:126, 58:129-58:131, 58:133N-58:136 |
| B\*51:42, 51:359, 53:62 | B\*57:04:02, B\*58:114 |
| B\*51:45, 51:81, 51:352, B\*53:44, 53:47 |

Abbreviations

w: might be weakly amplified.

?: nucleotide sequence information not available for the primer matching sequence.

**DR low resolution Interpretation Table**











**1**HLA-A, HLA-B, HLA-DRB and HLA-DQB1 alleles listed on the IMGT/HLA web page 2022-July-12, release 3.49.0, [www.ebi.ac.uk/imgt/hla](http://www.ebi.ac.uk/imgt/hla).

**2**Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

**3**The serological reactivity of all DRB alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

**4**The HLA-DRB1, -DRB3, -DRB4 and -DRB5 alleles will be grouped into their corresponding serological specificities, except that the following alleles give rise to identical amplification patterns:

|  |
| --- |
| Alleles |
| DRB1\*03:126, DRB1\*13:193 |
| DRB1\*08:09:02, DRB1\*14:15 |
| DRB1\*08:20, DRB1\*13:18, 13:47, 13:55, 13:158:01-13:158:02, 13:164, 13:232, 13:286 |
| DRB1\*08:31, DRB1\*11:05, 11:209 |
| DRB1\*08:41, 08:75, DRB1\*11:67, 11:193:01-11:193:02 |
| DRB1\*11:264, DRB1\*13:05:01:01-13:05:03, 13:07:01-13:07:02, 13:11:01-13:11:02, 13:14:01-13:14:03, 13:21:01:01-13:21:02, 13:42:01-13:42:02, 13:46, 13:49:01-13:50:03, 13:62, 13:100, 13:108, 13:132, 13:136, 13:150, 13:169, 13:189, 13:199, 13:203, 13:229, 13:246, 13:284, 13:302 |
| DRB1\*11:293, DRB1\*13:45 |
| DRB1\*12:57, DRB3\*02:111 |
| DRB1\*13:13, 13:119, 13:154, 13:156, DRB1\*14:84, 14:116, 14:144 |
| DRB1\*13:44, 13:86, 13:206, DRB1\*14:183 |
| DRB1\*13:235, DRB1\*14:98 |
| DRB1\*13:314, DRB1\*14:37 |

Abbreviations

w: might be weakly amplified.

?: nucleotide sequence information not available for the primer matching sequence.

**DQ low resolution Interpretation Table**



**1**HLA-A, HLA-B, HLA-DRB and HLA-DQB1 alleles listed on the IMGT/HLA web page 2022-July-12, release 3.49.0, [www.ebi.ac.uk/imgt/hla](http://www.ebi.ac.uk/imgt/hla).

**2**Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

**3**The serological split of the DQB1\*05:05-05:294, DQB1\*06:06 to 06:07, DQB1\*06:10, 06:13, 06:15-06:24 and 06:27 to 06:423N, DQB1\*02:04-02:198, DQB1\*03:07-03:09 03:11-03:478 and the DQB1\*04:03:01-04:90 alleles is not known. In this table we have used the expert-assigned serological grouping in Tissue Antigens (2009) 73:95-170, and also inferred the serological grouping from the naming of the sequence-defined allele.

**4**The DQB1 alleles will be grouped into their corresponding serological specificities, except that the following alleles give rise to identical amplification patterns:

|  |
| --- |
| Alleles |
| DQB1\*03:132, DQB1\*04:75 |
| DQB1\*05:01:01:01-05:43:01, 05:44-05:61, 05:63-05:303, DQB1\*06:325 |
| DQB1\*05:62, DQB1\*06:23, 06:156, 06:162, 06:169, 06:342, 06:389 |

Abbreviations

w: might be weakly amplified.

?: nucleotide sequence information not available for the primer matching sequence.