HLA-A\*24 (101.422-24/03, -24u/03u) Lot No: 2L4 Expiry Date: 2024-06-01

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

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

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

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

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

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

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

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

**Gel Picture**

|  |
| --- |
| PHOTO DOCUMENT |



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

Primer mixes 4, 6 and 48 may give rise to a lower yield of HLA-specific PCR product than the other A\*24 primer mixes.

Primer mixes 10, 20, 28, 29 and 61 have a tendency to giving rise to primer oligomer formation.

Primer mixes 1, 11, 19, 20, 27, 28, 29, 36, 45, 52, 54, 64, 68, 72, 76 and 84 may have tendencies of unspecific amplifications.

Primer mix 45 may give rise to a long fragment of approx. 500 bp in some HLA-A alleles. This band should not be considered in the interpretation of HLA-A\*24 typings.

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.





 













**1**HLA-A\*24 alleles in bold lettering are listed as confirmed alleles on the on the IMGT/HLA web page [www.ebi.ac.uk/imgt/hla](http://www.ebi.ac.uk/imgt/hla), release 3.27.0, January 2017.

**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 following HLA-A\*24 primer mixes have two or more product sizes:

|  |  |  |  |
| --- | --- | --- | --- |
| Primer Mix | Size of spec. PCR product | Amplified HLA-A\*24alleles | Other amplified HLA Class I alleles |
| **11** | 200 bp 240 bp | \*24:08, 24:42, 24:89, 24:310:01-24:310:02, 24:342, 24:409 \*24:61, 24:307 | \*02:76:01-02:76:02, 02:319, 02:666, 23:80, 30:22\*23:38N |
| **14** | 95 bp165 bp | \*24:09N, 24:267\*24:251  | \*23:18 |
| **15** | 105 bp 385 bp | \*24:19, 24:44, 24:100, 24:109, 24:260 \*24:14:01:01-24:15, 24:51, 24:53, 24:57, 24:92, 24:291, 24:296, 24:324, 24:458  | \*11:325\*02:46, 02:48, 02:70, 02:129, 02:571, 03:30, 03:152, 03:273, 11:325, 30:07, 31:08, 32:05, 32:79, 33:21, 33:53 |
| **21** | 155 bp215 bp | \*24:31\*24:294Q |  |
| **22** | 125 bp180 bp | \*24:27\*24:33, 24:387  | \*02:01:01:01-02:01:14Q, 02:01:17-02:01:19, 02:01:21-02:01:81, 02:01:83-02:01:163, 02:01:165-02:06:12, 02:06:14-02:07:03, 02:07:05-02:18, 02:20:01-02:22:02, 02:24:01-02:64:02, 02:66-02:68, 02:70-02:97:02, 02:99:01-02:99:02, 02:101:01-02:131:02, 02:133-02:134, 02:136-02:178, 02:180-02:304, 02:306-02:454, 02:456-02:468:02N, 02:469w, 02:470-02:613, 02:615-02:624, 02:626-02:650, 02:652-02:684, 02:686-02:691N, 02:693-02:803N, 02:805Q-02:821, 02:823-02:828, 02:830-02:914, 26:186, 66:36, 68:164, 69:01:01:01-69:08 |
| **24** | 215 bp 240 bp | \*24:24, 24:67, 24:129, 24:145, 24:156, 24:191, 24:290, 24:392\*24:19, 24:28, 24:44, 24:89, 24:290, 24:379, 24:406, 24:424  | \*01:02:01-01:02:02, 01:20, 01:188, 01:190, 01:307, 03:72, 11:88, 23:09, 23:51, 26:16, 29:37, 29:56, 30:01:01:01-30:04:03, 30:06, 30:09-30:20, 30:23-30:30, 30:32-30:54, 30:56-30:59N, 30:61-30:78N, 30:80-30:132N, 30:134-30:149, 30:151, 30:153-30:165, 32:07, 33:119, 68:45, 68:117\*02:76:01-02:76:02, 02:319, 02:666, 03:72, 11:88, 30:01:01:01-30:01:17, 30:11:01-30:11:02, 30:13-30:20, 30:23-30:24, 30:26, 30:30-30:31, 30:35-30:44, 30:46, 30:48-30:49, 30:52-30:54, 30:56, 30:58-30:60, 30:62-30:63, 30:65, 30:71-30:75, 30:78N, 30:81-30:83, 30:86-30:87, 30:89, 30:91-30:98, 30:102, 30:104, 30:106, 30:109-30:116, 30:118, 30:120, 30:122-30:123N, 30:125-30:126, 30:128-30:132N, 30:134-30:138, 30:140-30:143, 30:145N, 30:147-30:148, 30:154, 30:157, 30:159, 30:161, 30:163-30:165, 33:119, 68:45, 68:117 |
| **25** | 205 bp230 bp | \*24:13:01-24:13:02, 24:18, 24:24, 24:56, 24:94, 24:177, 24:188, 24:207:01-24:207:02, 24:228, 24:315, 24:355, 24:367, 24:381, 24:392 \*24:18, 24:204, 24:213 | \*02:17:02:01-02:17:04, 02:108, 02:110, 02:268, 02:300, 02:303, 02:617, 02:657, 03:347, 23:01:01:01-23:01:30, 23:03:01-23:65, 23:67-23:68, 23:70-23:104, 23:106N-23:108N, 29:07, 29:49, 31:29, 33:187, **B\*18:27**\*03:347 |
| **26** | 90 bp 220 bp | \*24:96, 24:256\*24:22, 24:160, 24:299, 24:478 |  |
| **27**  | 80 bp 370 bp | \*24:32\*24:14:01:01-24:14:01:04, 24:324  | \*23:36, 32:05, 32:79\*02:46, 02:48, 02:70, 02:129, 02:571 |
| **28**  | 75 bp 125 bp155 bp | \*24:155N\*24:266 \*24:35, 24:264, 24:441 | \*02:691N\*01:306, 11:193 |
| **29**  | 75 bp 120 bp200 bp | \*24:155N\*24:265, 24:271 \*24:08, 24:29, 24:42, 24:89, 24:309-24:310:02, 24:342, 24:359N  | \*02:691N\*01:45, 03:78, 11:108, 23:92, 23:96\*02:76:01-02:76:02, 02:319, 02:666, 23:80, 23:100, 30:22 |
| **30** | 125 bp 200 bp | \*24:21:01-24:21:03, 24:208:01-24:208:02 \*24:59, 24:190, 24:210, 24:229, 24:285, 24:395  | \*01:301Q, 03:347, 11:139, 23:03:01-23:03:02, 23:70, 23:83, 29:07, 29:49, 31:29, 33:187, **B\*18:27**\*01:301Q, 11:139 |
| **31** | 155 bp 235 bp | \*24:37\*24:04, 24:109, 24:119, 24:129  | \*01:02:01-01:02:02, 01:20, 01:188, 01:190, 01:307, 26:16, 29:37, 29:56, 30:57, 30:90 |
| **35** | 180 bp205 bp | \*24:142:01- 24:142:02\*24:45N, 24:88  |  |
| **36**  | 115 bp220 bp245 bp | \*24:47, 24:124\*24:192\*24:232N  | **\***31:07, 31:10, **B\*51:290, B\*52:87, B\*53:58****B\*49:27** |
| **38** | 145 bp 170 bp 230 bp | \*24:49\*24:137\*24:126 |  |
| **39** | 75 bp 210 bp | \*24:185N\*24:50  | \*02:129, 11:325 |
| **40** | 95 bp225 bp | \*24:02:03Q\*24:08, 24:20:01:01-24:20:01:02, 24:88, 24:337, 24:342  | \*01:01:38L, 11:01:98 |
| **41** | 200 bp 240 bp | \*24:26, 24:62, 24:314 \*24:118, 24:132N | \*01:39, 01:145, 23:45, 26:29, 26:49, 31:05, 32:13, 33:10, 66:10 |
| **42** | 95 bp160 bp 190 bp | \*24:312N\*24:22, 24:160, 24:276, 24:299, 24:478\*24:24, 24:67, 24:169, 24:290, 24:392  | \*02:262, 02:547, 02:700, 02:910 \*26:16, 30:163, 33:119, 68:45, 68:117, **C\*04:81** |
| **45** | 150 bp200 bp 240 bp  | \*24:276\*24:113, 24:370N\*24:14:01:01-24:14:01:04, 24:52, 24:132N, 24:233, 24:291, 24:324 | \*01:20, 01:66, 01:73, 01:130, 02:19, 02:36-02:37, 02:54, 02:255, 02:417, 02:723, 02:848, 02:883, 25:36, 25:65, 26:29, 26:49, 66:10, **B\*07:64w, B\*15:12:01w-15:12:03w, B\*15:19w, B\*15:270w, B\*15:298w, B\*15:304Nw** |
| **47** | 195 bp 410 bp | \*24:18, 24:56, 24:123, 24:177, 24:355, 24:367, 24:381 \*24:26  | \*03:347\*03:30, 03:152, 03:273, 11:325, 30:07, 31:08, 32:05, 32:79, 33:53 |
| **49** | 165 bp 250 bp | \*24:159\*24:23, 24:220  | **B\*18:27** |
| **50** | 165 bp225 bp 260 bp | \*24:251\*24:34, 24:252N, 24:270\*24:163N, 24:255  | \*23:27 |
| **51** | 165 bp 215 bp | \*24:140\*24:38, 24:337 |  |
| **52**  | 75 bp210 bp240 bp | \*24:293\*24:264, 24:441\*24:40N  | \*11:359\*01:306, 11:193 |
| **53** | 125 bp 160 bp230 bp | \*24:158N\*24:303N\*24:55, 24:315, 24:374 |  |
| **54** | 175 bp285 bp | \*24:58, 24:169, 24:359N\*24:248  | **C\*04:81****C\*03:231, C\*04:52, C\*04:55, C\*04:405, C\*14:10, C\*14:46:02** |
| **55** | 80 bp240 bp 275 bp | \*24:205\*24:60N, 24:302, 24:307\*24:173  | \*23:40 |
| **59** | 240 bp 280 bp | \*24:68, 24:143\*24:127, 24:215, 24:288 | \*23:78 |
| **60** | 140 bp210 bp 275 bp | \*24:250\*24:183N, 24:270\*24:69 |  |
| **61**  | 105 bp165 bp 280 bp | \*24:70\*24:323N\*24:127, 24:141, 24:288  |  |
| **62** | 120 bp180 bp280 bp | \*24:72, 24:91 \*24:275\*24:297 | \*01:243, 02:106, 02:145\*23:16, 33:180, 68:107 |
| **65** | 80 bp 155 bp180 bp235 bp | \*24:75\*24:194\*24:275\*24:90:01N-24:90:02N  | \*01:267\*02:88N, 02:622N, 02:643N?  |
| **67** | 90 bp230 bp | \*24:249, 24:267\*24:79  | \*23:18, 23:88 |
| **68** | 220 bp 280 bp | \*24:143, 24:353\*24:78, 24:141, 24:196 |  |
| **69** | 115 bp 200 bp265 bp | \*24:80, 24:225:01-24:225:02\*24:370N\*24:184, 24:240N  | **C\*04:302, C\*14:14** |
| **70** | 110 bp200 bp 255 bp | \*24:134\*24:96, 24:146\*24:81, 24:356 |  |
| **71** | 120 bp 205 bp 250 bp | \*24:128, 24:269 \*24:183N, 24:199\*24:82, 24:280  | \*23:29\*29:13, 31:07-31:08, 31:10, 32:42, 32:97 |
| **72** | 120 bp150 bp | \*24:83N, 24:265-24:266 \*24:354 |  |
| **73** | 100 bp 170 bp | \*24:84N\*24:131, 24:138, 24:188, 24:218  | \*02:17:02:01-02:17:04, 02:108, 02:110, 02:268, 02:300, 02:303, 02:617, 02:657, 02:680 |
| **74** | 155 bp 195 bp | \*24:180, 24:323N\*24:85, 24:197  |  |
| **75** | 145 bp190 bp 285 bp | \*24:180\*24:345\*24:86N, 24:196, 24:215  | \*23:78 |
| **76** | 175 bp 255 bp | \*24:76, 24:263\*24:98, 24:220  | **B\*18:27** |
| **77** | 115 bp145 bp 210 bp | \*24:331\*24:122\*24:06, 24:87, 24:138, 24:167, 24:285, 24:289, 24:339, 24:381  | \*02:680, 23:02, 23:66 |
| **79** | 195 bp 250 bp | \*24:182\*24:14:01:01-24:14:01:04, 24:93, 24:114, 24:233, 24:324 | \*23:76\*01:20, 01:66, 01:130, 02:19, 02:36-02:37, 02:54, 02:255, 02:417, 02:723, 02:848, 02:883  |
| **80** | 170 bp 220 bp | \*24:140, 24:142:01-24:142:02\*24:95 |  |
| **81** | 100 bp 215 bp | \*24:139\*24:97, 24:133, 24:377 |  |
| **82** | 185 bp 230 bp285 bp | \*24:99, 24:130\*24:125, 24:302, 24:472\*24:248  | **\***23:40**C\*03:231, C\*04:52, C\*04:55, C\*04:405, C\*14:10, C\*14:46:02** |
| **83** | 125 bp 270 bp | \*24:111, 24:225:01-24:225:02\*24:101, 24:173, 24:240N  | **C\*04:302, C\*14:14** |
| **84**  | 105 bp210 bp290 bp | \*24:103, 24:331\*24:107\*24:102, 24:287 |  |
| **85** | 145 bp 210 bp | \*24:117\*24:104 | \*03:30, 03:152, 03:273, 23:64, 32:05, 32:79 |
| **86** | 190 bp 255 bp | \*24:121, 24:182 \*24:105, 24:222N, 24:356 | \*23:76, 23:97  |
| **87** | 90 bp 120 bp 190 bp | \*24:17, 24:41, 24:62, 24:106, 24:208:01-24:208:02, 24:330\*24:110\*24:136, 24:197  | \*01:301Q, 03:347, 11:139, 23:31, 23:45, 23:53, 23:70, 29:07, 29:49, 31:29, 33:187 |
| **88** | 75 bp 170 bp420 bp | \*24:185N\*24:116, 24:137\*24:352 |  |
| **89** | 75 bp220 bp 270 bp | \*24:07:01:01-24:07:03, 24:108, 24:112, 24:131, 24:288, 24:339, 24:347:01-24:347:02, 24:387, 24:453, 24:457, 24:477 \*24:192 \*24:112, 24:414  | **\***23:13**B\*49:27****B\*13:102, B\*44:322, B\*51:129** |
| **90** | 100 bp 180 bp265 bp290 bp | \*24:115, 24:206\*24:168 \*24:322\*24:234, 24:287, 24:339, 24:347:02  | \*23:47 |
| **91** | 80 bp270 bp | \*24:135:01-24:135:02, 24:357N\*24:238 | \*23:45, 23:73 |
| **92** | 150 bp185 bp | \*24:354\*24:144, 24:263, 24:268  |  |
| **93** | 170 bp245 bp270 bp | \*24:74:01-24:74:02\*24:280\*24:112, 24:414  | \*23:102, **B\*13:90, B\*37:90, B\*44:63w, B\*57:105**\*32:97**B\*13:102, B\*44:322, B\*51:129** |
| **94** | 105 bp190 bp220 bp265 bp | \*24:206\*24:345\*24:278N\*24:322 |  |
| **95** | 115 bp145 bp260 bp355 bp | \*24:269\*24:231, 24:250\*24:163N\*24:14:01:01-24:14:01:04, 24:291, 24:410  | \*02:81, 02:87, 02:112, 02:124, 02:129, 02:136, 02:571, 23:82 |

**4**The following HLA-A\*24 alleles can be distinguished by the different sizes of the HLA-specific PCR product:

|  |  |  |  |
| --- | --- | --- | --- |
| Alleles | Primer mix | Alleles | Primer mix |
| A\*24:29, 24:271 | 29 | A\*24:84N, 24:218 | 73 |
| A\*24:37, 24:119 | 31 | A\*24:101, 24:111 | 83 |
| A\*24:47, 24:232N | 36 | A\*24:102, 24:103 | 84 |
| A\*24:49, 24:126 | 38 | A\*24:104, 24:117 | 85 |
| A\*24:60N, 24:205 | 55 | A\*24:105, 24:121 | 86 |
| A\*24:72, 24:297 | 62 | A\*24:106, 24:136, 24:330 | 87 |
| A\*24:76, 24:98 | 76 | A\*24:115, 24:234 | 90 |
| A\*24:78, 24:353 | 68 | A\*24:116, 24:352 | 88 |
| A\*24:79, 24:249 | 67 | A\*24:135:01-24:135:02, 24:238 | 91 |
| A\*24:80, 24:184 | 69 | A\*24:206, 24:322 | 90, 94 |
| A\*24:81, 24:134 | 70 | A\*24:225:01-24:225:02, 24:240N | 69, 83 |
| A\*24:82, 24:128 | 71 | A\*24:231, 24:410 | 95 |

**5**The HLA-A\*24 primer set cannot separate the following alleles. These alleles can be distinguished by the HLA-A low resolution and/or HLA-A\*02, HLA-A\*23 and HLA-A\*33 kits.

|  |
| --- |
| Alleles |
| A\*24:164, 24:373, 24:399, 24:405 24:446, 02:804, 33:19 |
| A\*24:13:01-24:13:02, 23:104 |

Abbreviations

‘w’, might be weakly amplified.

‘?’, nucleotide sequence information not available for the primer matching sequence.

Changes in revision R01 compared to R00:

1. In primer mixes 3 and 5, the reactivity for A\*24:52 was changed from negative to weak.

Changes in Revision R02 compared to R01:

1. Primer mix 24 amplifies the A\*24:129 and the A\*01:02:01-01:02:02, 01:20, 01:188, 01:190, 01:307 and 23:09 alleles. This correction has been implemented in the specificity and interpretation tables.