HLA-A\*24 (101.422-24/03, -24u/03u) Lot No: 3R9 Expiry Date: 2026-11-01

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.

In primer mix 95 the positive control band may be weaker than for other HLA-A\*24 primer mixes.

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 | \*02:76:01-02:76:03, 02:319, 02:666, 23:80, 30:22  \*23:38N |
| **14** | 95 bp  165 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, 24:551, 24:555, 24:557 | \*11:325, 23:112, 23:122, 25:77  \*02:46, 02:48, 02:70, 02:129, 02:571, 02:1050, 03:30, 03:152, 03:273, 11:325, 25:77, 25:81-25:82, 30:07, 31:08, 32:05, 32:79, 33:21, 33:53, 68:249 |
| **21** | 155 bp  215 bp | \*24:31  \*24:294Q |  |
| **22** | 125 bp  180 bp | \*24:27  \*24:33, 24:387 | \*02:01:01:01-02:01:07, 02:01:09-02:01:14Q, 02:01:17-02:01:19, 02:01:21-02:01:81, 02:01:83-02:01:163, 02:01:165-02:01:196, 02:01:198-02:05:11, 02:05:13-02:06:12, 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, 02:101:01-02:131:03, 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, 02:830:01-02:925, 02:928-02:966, 02:968-02:1060, 02:1062N-02:1063N, 26:186, 66:36, 68:164, 69:01:01:01-69:09 |
| **24** | 215 bp  240 bp | \*24:24, 24:67, 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 | \*03:72, 11:88, 23:51, 26:16, 29:37, 29:56, 30:01:01:01-30:04:04, 30:06, 30:09:01:01-30:20, 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, 30:167-30:176, 30:178N-30:185, 30:187-30:203, 31:210, 32:07, 33:119, 68:45, 68:117  \*02:76:01-02:76:03, 02:319, 02:666, 03:72, 11:88, 30:01:01:01-30:01:21, 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, 30:167-30:168, 30:170-30:173, 30:176, 30:178N-30:181, 30:183-30:185, 30:187, 30:190-30:192, 30:194-30:197N, 30:199, 30:201-30:203, 31:210, 33:119, 68:45, 68:117 |
| **25** | 205 bp  230 bp | \*24:13:01-24:13:02, 24:18, 24:24, 24:56:01-24:56:02, 24:94, 24:177, 24:188, 24:207:01-24:207:02, 24:228, 24:315, 24:355, 24:367, 24:381, 24:392, 24:515, 24:569  \*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, 02:1054, 03:347, 23:01:01:01-23:01:37, 23:03:01-23:65, 23:67-23:68, 23:70-23:104, 23:106N-23:112, 23:114-23:124, 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, 25:77, 32:05, 32:79  \*02:46, 02:48, 02:70, 02:129, 02:571, 02:1050 |
| **28** | 75 bp  125 bp  155 bp | \*24:155N  \*24:266  \*24:35, 24:264, 24:441 | \*02:691N  \*01:306, 11:193 |
| **29** | 75 bp  120 bp  200 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, 30:201, 36:12  \*02:76:01-02:76:03, 02:319, 02:666, 23:80, 23:100, 30:22 |
| **30** | 125 bp  200 bp | \*24:21:01-24:21:03, 24:208:01-24:208:02:02, 24:489, 24:499, 24:562  \*24:59, 24:190, 24:210, 24:229, 24:285, 24:395, 24:503 | \*01:301Q, 03:347, 11:139, 23:03:01-23:03:02:02, 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 | \*30:188  \*01:02:01:01-01:02:02, 01:20, 01:188, 01:190, 01:307, 01:412, 26:16, 29:37, 29:56, 30:57, 30:90 |
| **35** | 180 bp  205 bp | \*24:142:01- 24:142:02  \*24:45N, 24:88 |  |
| **36** | 115 bp  220 bp  245 bp | \*24:47, 24:124  \*24:192  \*24:232N | **\***23:114, 31:07, 31:10, **B\*44:540, B\*51:290, B\*52:87, B\*53:58**  **B\*49:27** |
| **38** | 145 bp  170 bp  230 bp | \*24:49:01-24:49:02  \*24:137  \*24:126 |  |
| **39** | 75 bp  210 bp | \*24:185N  \*24:50 | \*02:129, 02:1050, 11:325, 25:81-25:82, 68:249 |
| **40** | 95 bp  225 bp | \*24:02:03Q  \*24:08, 24:20:01:01-24:20:02, 24:88, 24:337, 24:342 | \*01:01:38L, 03:01:96, 11:01:98, 30:02:25 |
| **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 bp  160 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 bp  200 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, 02:949, 25:36, 25:65, 26:29, 26:49, 26:205, 66:10, 69:09, **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, 24:56:01-24:56:02, 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 bp  225 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 bp  210 bp  240 bp | \*24:293  \*24:264, 24:441  \*24:40N | \*11:359  \*01:306, 11:193 |
| **53** | 125 bp  160 bp  230 bp | \*24:158N  \*24:303N  \*24:55, 24:315, 24:374 |  |
| **54** | 175 bp  285 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 bp  240 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 bp  210 bp  275 bp | \*24:250  \*24:183N, 24:270  \*24:69 |  |
| **61** | 105 bp  165 bp  280 bp | \*24:70  \*24:323N  \*24:127, 24:141, 24:288 |  |
| **62** | 120 bp  180 bp  280 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 bp  180 bp  235 bp | \*24:75  \*24:194  \*24:275  \*24:90:01N-24:90:02N | \*01:267  \*02:88N, 02:622N, 02:643N? |
| **67** | 90 bp  230 bp | \*24:249, 24:267, 24:544  \*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 bp  265 bp | \*24:80, 24:225:01-24:225:02  \*24:370N  \*24:184, 24:240N | **C\*04:302, C\*14:14** |
| **70** | 110 bp  200 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 bp  150 bp | \*24:83N, 24:265-24:266  \*24:354 |  |
| **73** | 100 bp  170 bp | \*24:84N  \*24:131, 24:138, 24:188, 24:218, 24:515 | \*02:17:02:01-02:17:04, 02:108, 02:110, 02:268, 02:300, 02:303, 02:617, 02:657, 02:680, 02:963, 02:1054 |
| **74** | 155 bp  195 bp | \*24:180, 24:323N  \*24:85, 24:197 |  |
| **75** | 145 bp  190 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 bp  145 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, 02:963, 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, 02:949, 69:09 |
| **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 bp  285 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 bp  210 bp  290 bp | \*24:103, 24:331  \*24:107  \*24:102, 24:287, 24:566 |  |
| **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 | \*24:17:01:01-24:17:01:02, 24:41, 24:62, 24:106, 24:208:01-24:208:02:02, 24:330, 24:488, 24:499, 24:503, 24:535  \*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 bp  420 bp | \*24:185N  \*24:116, 24:137  \*24:352 |  |
| **89** | 75 bp  220 bp  270 bp | \*24:07:01:01-24:07:04, 24:108, 24:112, 24:131, 24:288, 24:339, 24:347:01-24:347:02, 24:387, 24:453, 24:457, 24:477, 24:489, 24:510, 24:528, 24:541, 24:544, 24:566, 24:569, 24:574  \*24:192  \*24:112, 24:414 | **\***23:13  **B\*49:27**  **B\*13:102, B\*44:322, B\*51:129** |
| **90** | 100 bp  180 bp  265 bp  290 bp | \*24:115, 24:206  \*24:168  \*24:322  \*24:234, 24:287, 24:339, 24:347:02 | \*23:124  \*23:47 |
| **91** | 80 bp  270 bp | \*24:135:01-24:135:02, 24:357N, 24:524  \*24:238 | \*23:45, 23:73 |
| **92** | 150 bp  185 bp | \*24:354  \*24:144, 24:263, 24:268 |  |
| **93** | 170 bp  245 bp  270 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 bp  190 bp  220 bp  265 bp | \*24:206  \*24:345  \*24:278N  \*24:322 | **\***23:124 |
| **95** | 115 bp  145 bp  260 bp  355 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\*24:49:01-24:49:02, 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\*24:02:01:01, 24:02:01:03-24:02:02, 24:02:04, 24:02:06-24:02:09, 24:02:11-24:02:64, 24:02:66-24:02:88, 24:02:90-24:02:99, 24:02:101-24:02:122, 24:02:124-24:02:155, 24:147-24:154, 24:161-24:162, 24:165-24:166, 24:170-24:172:02, 24:174-24:176, 24:178-24:179, 24:181, 24:186-24:187, 24:189, 24:193, 24:195, 24:198, 24:200-24:203, 24:209, 24:212, 24:214, 24:216-24:217, 24:221, 24:223-24:224, 24:226:01-24:226:02, 24:230, 24:236-24:237, 24:239, 24:241-24:247, 24:254, 24:257-24:259, 24:261-24:262, 24:272-24:274, 24:277, 24:279, 24:281-24:282, 24:284, 24:286, 24:292, 24:295, 24:298, 24:301, 24:305-24:306, 24:311, 24:313:01-24:313:02, 24:317-24:318, 24:320-24:321, 24:325-24:326, 24:328, 24:332, 24:334-24:336, 24:338, 24:341, 24:343, 24:346, 24:350-24:351, 24:358, 24:360-24:366, 24:368-24:369, 24:371-24:372, 24:375-24:376, 24:378Q, 24:380, 24:382-24:386, 24:388N-24:389N, 24:391, 24:393-24:394, 24:396N-24:398, 24:400-24:403, 24:407, 24:411, 24:413, 24:415-24:423, 24:425N-24:440, 24:442-24:445N, 24:447Q-24:449, 24:451-24:452, 24:454-24:456N, 24:460:01:01-24:460:01:02, 24:463-24:470, 24:473Q-24:476, 24:479Q-24:480, 24:482, 24:484-24:487, 24:490-24:493, 24:496-24:497, 24:500-24:502, 24:505, 24:507-24:509, 24:511-24:513Q, 24:516-24:523, 24:525-24:526, 24:529N-24:531, 24:533-24:534, 24:536Q-24:539, 24:543, 24:545-24:550, 24:552-24:554, 24:556N, 24:558, 24:560-24:561, 24:564-24:565, 24:567N-24:568N, 24:571, 24:573, 24:575-24:578, 23:113N |
| A\*24:13:01-24:13:02, 23:104 |
| A\*24:164, 24:373, 24:399, 24:405, 24:446, 24:572, 02:804, 33:19 |
| A\*24:555, 33:21 |

Abbreviations

‘w’, might be weakly amplified.

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