

OPTN/UNOS Policy Notice

Review of HLA Tables (2016)

Sponsoring Committee: Histocompatibility
Policy/Bylaws Affected: Policy 4.10 (Reference Tables of HLA Antigen Values and Split Equivalences)
Public Comment: July 31, 2017 – October 02, 2017
Effective Date: Pending implementation and notice to members

Problem Statement

During the 2016-2017 review of the equivalency tables, the Committee identified a need to update the existing equivalency tables and to include HLA-DPB1 equivalences in Policy. Additionally, they found that the nomenclature in the equivalency tables was not aligned with the current World Health Organization (“WHO”) HLA nomenclature.

Summary of Changes

This proposal makes the following changes to Policy:

- Updates existing equivalency tables with new equivalences that are detectable by current testing methods
- Creates an unacceptable antigen equivalency table for HLA-DPB1
- Adds colons for all specific alleles and a zero in front of single digit allele groups with specific alleles (ex. HLA-A 02:02)

What Members Need to Do

This Policy change impacts histocompatibility labs. You should familiarize yourself with the changes to the equivalency tables. You should also work with third-party vendors to determine how the changes affect electronic uploads of candidate unacceptable antigen data.

Affected Policy Language

New language is underlined (example) and language that is deleted is struck through (~~example~~).

4.10 Reference Tables of HLA Antigen Values and Split Equivalences

Tables 4-2, 4-3, and 4-4 show candidate-donor antigen equivalences and whether they are mismatches. For each candidate antigen, the donor antigens that are not mismatched are listed below. All other combinations are considered mismatches.

Examples of how “Matching Antigen Equivalences” works:

- If the candidate types as B70: only donors that type as B70 are considered matched. Donors typed as B71 or B72 are considered mismatched.
- If the candidate types as B71: only donors that type as B71, ~~or~~ B15:10, or B15:18 are considered matched. Donors typed as B70 are considered mismatched.

Table 4-2: HLA A Matching Antigen Equivalences

Candidate A-Locus Antigen	Equivalent Donor Antigens
1	<u>1, 01:01, 01:02</u>
<u>01:01</u>	<u>01:01, 1</u>
<u>01:02</u>	<u>01:02, 1</u>
2	<u>2, 02:01, 02:02, 02:03, 02:05, 02:06, 02:07, 02:10, 02:18</u>
<u>02:01</u>	<u>02:01, 2</u>
<u>02:02</u>	<u>02:02, 2</u>
<u>02:03</u>	<u>02:03, 2</u>
<u>02:05</u>	<u>02:05, 2</u>
<u>02:06</u>	<u>02:06, 2</u>
<u>02:07</u>	<u>02:07, 2</u>
<u>02:10</u>	<u>02:10, 2</u>
<u>02:18</u>	<u>02:18, 2</u>
3	<u>3, 03:01, 03:02, 32:04</u>
<u>03:01</u>	<u>03:01, 3</u>
<u>03:02</u>	<u>03:02, 3</u>
9	9
10	10
11	11, <u>11:01, 11:02</u>
<u>11:01</u>	<u>11:01, 11</u>
<u>11:02</u>	<u>11:02, 11</u>
19	19
23	23
24	<u>24, 24:02, 24:03</u>
<u>24:02</u>	<u>24:02, 24</u>
<u>24:03</u>	<u>24:03, 24</u>
25	25
26	<u>26, 26:01, 26:02, 26:03</u>
<u>26:01</u>	<u>26:01, 26</u>
<u>26:02</u>	<u>26:02, 26</u>
<u>26:03</u>	<u>26:03, 26</u>
28	28
29	<u>29, 29:01, 29:02</u>
<u>29:01</u>	<u>29:01, 29</u>
<u>29:02</u>	<u>29:02, 29</u>
30	<u>30, 30:01, 30:02</u>
<u>30:01</u>	<u>30:01, 30</u>
<u>30:02</u>	<u>30:02, 30</u>
31	31
32	32
<u>32:04</u>	<u>32:04, 3</u>
33	<u>33, 33:01, 33:03</u>
<u>33:01</u>	<u>33:01, 33</u>
<u>33:03</u>	<u>33:03, 33</u>
34	<u>34, 34:01, 34:02</u>

Candidate A-Locus Antigen	Equivalent Donor Antigens
34:01	34:01, 34
34:02	34:02, 34
36	36
43	43
66	66, 66:01, 66:02
66:01	66:01, 66
66:02	66:02, 66
68	68, 68:01, 68:02
68:01	68:01, 68
68:02	68:02, 68
69	69
74	74
80	80

Table 4-3: HLA B Matching Antigen Equivalences

Candidate B-Locus Antigen	Equivalent Donor Antigens
5	5
7	7, 07:02, 07:03, 07:14
07:02	07:02, 7
07:03	07:03, 7
07:14	07:14, 7
8	8, 08:01, 08:02, 08:03, 08:04
08:01	08:01, 8
08:02	08:02, 8
08:03	08:03, 8
08:04	08:04, 8
12	12
13	13, 13:01, 13:02
13:01	13:01, 13
13:02	13:02, 13
14	14
14:01	14:01, 64
14:02	14:02, 65
15	15
15:01	15:01, 62
15:02	15:02, 75
15:03	15:03, 72
15:04	15:04, 62
15:06	15:06, 62
15:07	15:07, 62
15:10	15:10, 71
15:11	15:11, 75
15:12	15:12, 76
15:13	15:13, 77
15:16	15:16, 63

Candidate B-Locus Antigen	Equivalent Donor Antigens
15:17	15:17, 63
15:18	15:18, 71
15:20	15:20, 62
15:21	15:21, 75
15:24	15:24, 62
15:27	15:27, 62
16	16
17	17
18	18
21	21
22	22
27	27, 27:03, 27:04, 27:05, 27:06, 27:08
27:03	27:03, 27
27:04	27:04, 27
27:05	27:05, 27
27:06	27:06, 27
27:08	27:08
35	35, 35:01, 35:02, 35:03, 35:08, 35:12
35:01	35:01, 35
35:02	35:02, 35
35:03	35:03, 35
35:08	35:08, 35
35:12	35:12, 35
37	37
38	38, 38:01, 38:02
38:01	38:01, 38
38:02	38:02, 38
39	39, 39:01, 39:02, 39:04, 39:05, 39:06, 39:13
39:01	39:01, 39
39:02	39:02, 39
39:04	39:04, 39
39:05	39:05, 39
39:06	39:06, 39
39:13	39:13, 39
40	40, 40:01, 40:02, 40:06
40:01	40:01, 60, 40
40:02	40:02, 61, 40
40:03	40:03, 61
40:04	40:04, 61
40:05	40:05, 50
40:06	40:06, 61, 40
41	41, 41:01, 41:02
41:01	41:01, 41
41:02	41:02, 41
42	42, 42:01, 42:02

Candidate B-Locus Antigen	Equivalent Donor Antigens
<u>42:01</u>	<u>42:01, 42</u>
<u>42:02</u>	<u>42:02, 42</u>
44	44, <u>44:02, 44:03</u>
<u>44:02</u>	<u>44:02, 44</u>
<u>44:03</u>	<u>44:03, 44</u>
<u>4415</u>	<u>4415, 45</u>
45	45, <u>4415, 50:02</u>
46	46
47	47
48	<u>48, 48:01, 48:02</u>
<u>48:01</u>	<u>48:01, 48</u>
<u>48:02</u>	<u>48:02, 48</u>
49	49
50	<u>50, 50:01, 50:02, 40:05</u>
50:01	<u>50:01, 50</u>
50:02	<u>50:02, 45</u>
51	51, <u>51:01, 51:02</u>
<u>51:01</u>	<u>51:01, 51</u>
<u>51:02</u>	<u>51:02, 51</u>
52	52
53	53
54	54
55	<u>55, 55:01, 55:02, 55:04</u>
<u>55:01</u>	<u>55:01, 55</u>
<u>55:02</u>	<u>55:02, 55</u>
<u>55:04</u>	<u>55:04, 55</u>
56	<u>56, 56:01, 56:03</u>
<u>56:01</u>	<u>56:01, 56</u>
<u>56:03</u>	<u>56:03, 56</u>
57	<u>57, 57:01, 57:03</u>
<u>57:01</u>	<u>57:01, 57</u>
<u>57:03</u>	<u>57:03, 57</u>
58	58
59	59
60	60, <u>40:01</u>
61	61, <u>40:02, 40:03, 40:04, 40:06</u>
62	<u>62, 15:01, 15:04, 15:06, 15:07, 15:20, 15:27</u>
63	<u>63, 15:16, 15:17</u>
64	64, <u>14:01</u>
65	65, <u>14:02</u>
67	67
70	70
71	<u>71, 15:10, 15:18</u>
72	<u>72, 15:03</u>
73	73

Candidate B-Locus Antigen	Equivalent Donor Antigens
75	75, 15:02, 15:11, 15:21
76	76, 15:12
77	77, 15:13
78	78
81	81
82	82

Table 4-4: HLA DR Matching Antigen Equivalences

Candidate DR-Locus Antigen	Equivalent Donor Antigens
1	1, 01:01, 01:02
01:01	01:01, 1
01:02	01:02, 1
01:03	01:03
2	2
3	3, 03:01, 03:02
03:01	03:01, 17
03:02	03:02, 18
4	4, 04:01, 04:02, 04:03, 04:04, 04:05, 04:06, 04:07, 04:10, 04:11
04:01	04:01, 4
04:02	04:02, 4
04:03	04:03, 4
04:04	04:04, 4
04:05	04:05, 4
04:06	04:06, 4
04:07	04:07, 4
04:10	04:10, 4
04:11	04:11, 4
5	5
6	6
7	7
8	8, 08:01, 08:02, 08:03, 08:07
08:01	08:01, 8
08:02	08:02, 8
08:03	08:03, 8
08:07	08:07, 8
9	9, 09:01, 09:02
09:01	09:01, 9
09:02	09:02, 9
10	10
11	11, 11:01, 11:04
11:01	11:01, 11
11:04	11:04, 11
12	12, 12:01, 12:02
12:01	12:01, 12
12:02	12:02, 12
13	13, 13:01, 13:02, 13:03

Candidate DR-Locus Antigen	Equivalent Donor Antigens
13:01	13:01, 13
<u>13:02</u>	<u>13:02</u> , 13
13:03	13:03, 13
14	14, 14:01, 14:02, 14:03, 14:04, 14:05, 14:06, 14:54
14:01	14:01, 14, 14:54
14:02	14:02, 14
14:03	14:03, 14
14:04	14:04, 14
<u>14:05</u>	<u>14:05</u> , 14
<u>14:06</u>	<u>14:06</u> , 14
14:54	14:54, 14, 14:01
15	15, 15:01, 15:02, 15:03
15:01	15:01, 15
15:02	15:02, 15
15:03	15:03, 15
16	16, 16:01, 16:02
16:01	16:01, 16
16:02	16:02, 16
17	17, 03:01
18	18, 03:02

Tables 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, and 4-13, and 4-14 show candidate-donor unacceptable antigen combinations. For each candidate antigen, the donor antigens that are unacceptable are listed below. Table 4-14 4-15 shows additional unacceptable antigen equivalences to be used in the Calculated Panel Reactive Antibody (CPRA) only.

Examples of how “Unacceptable Antigen Equivalences” works:

If a candidate has B70 listed as an “unacceptable antigen”, donors typed as B70, B71, B72, 15:03, or 15:10, or 15:18 are considered unacceptable.

Table 4-5: HLA A Unacceptable Antigen Equivalences

Candidate Unacceptable A-Locus Antigen	Donor Equivalent Antigens
1	1, <u>01:01</u> , <u>01:02</u>
<u>01:01</u>	<u>01:01</u>
<u>01:02</u>	<u>01:02</u>
2	2, 02:01, 02:02, 02:03, 02:05, 02:06, <u>02:07</u> , 02:10, 02:18
02:01	02:01
02:02	02:02
02:03	02:03
02:05	02:05
02:06	02:06
<u>02:07</u>	<u>02:07</u>
<u>02:10</u>	<u>02:10</u>
<u>02:18</u>	<u>02:18</u>
3	3, 03:01, 03:02, <u>32:04</u>
<u>03:01</u>	<u>03:01</u>

Candidate Unacceptable A-Locus Antigen	Donor Equivalent Antigens
<u>03:02</u>	<u>03:02</u>
9	9, 23, 24, 24:02, 24:03
10	10, 25, 26, <u>26:01, 26:02, 26:03</u> , 34, 34:01, 34:02, 66, 66:01, 66:02, 43
11	11, 11:01, 11:02
11:01	11:01
11:02	11:02
19	19, 29, 29:01, 29:02, 30, 30:01, 30:02, 31, 32, 33, 33:01, 33:03, 74
23	23
24	24, 24:02, 24:03
24:02	24:02
24:03	24:03
25	25
26	26, <u>26:01, 26:02, 26:03</u>
<u>26:01</u>	<u>26:01</u>
<u>26:02</u>	<u>26:02</u>
<u>26:03</u>	<u>26:03</u>
28	28, 68, 69, 68:01, 68:02
29	29, 29:01, 29:02
29:01	29:01
29:02	29:02
30	30, 30:01, 30:02
30:01	30:01
30:02	30:02
31	31
32	32
<u>32:04</u>	<u>32:04</u>
33	33, 33:01, 33:03
33:01	33:01
33:03	33:03
34	34, 34:01, 34:02
34:01	34:01
34:02	34:02
36	36
43	43
66	66, 66:01, 66:02
66:01	66:01
66:02	66:02
68	68, 68:01, 68:02
68:01	68:01
68:02	68:02
69	69
74	74
80	80

Table 4-6 HLA B Unacceptable Antigen Equivalences

Candidate Unacceptable B-Locus Antigen	Donor Equivalent Antigens
5	5, 51, 51:01, 51:02, <u>52</u>
7	7, 07:02, <u>07:14</u>
07:02	07:02
<u>07:14</u>	<u>07:14</u>
8	8, 08:01, 08:02, 08:03, 08:04
08:01	08:01
08:02	08:02
08:03	08:03
08:04	08:04
12	12, 44, 44:02, 44:03, 44:15 , 45
13	13, 13:01, 13:02
13:01	13:01
13:02	13:02
14	14, 64, 65, 14:01, 14:02
14:01	14:01, <u>64</u>
14:02	14:02, <u>65</u>
15	15, 62, 63, <u>70, 71, 72</u> , 75, 76, 77, 15:01, 15:02, 15:03, <u>15:04</u> , <u>15:06</u> , <u>15:07</u> , 15:10, 15:11, 15:12, 15:13, 15:16, 15:17, <u>15:18</u> , <u>15:20</u> , <u>15:21</u> , <u>15:24</u> , <u>15:27</u>
15:01	15:01
15:02	15:02
15:03	15:03
<u>15:04</u>	<u>15:04</u>
<u>15:06</u>	<u>15:06</u>
<u>15:07</u>	<u>15:07</u>
15:10	15:10
15:11	15:11
15:12	15:12
15:13	15:13
15:16	15:16
15:17	15:17
<u>15:18</u>	<u>15:18</u>
<u>15:20</u>	<u>15:20</u>
<u>15:21</u>	<u>15:21</u>
<u>15:24</u>	<u>15:24</u>
<u>15:27</u>	<u>15:27</u>
16	16, 38, 38:01, 38:02, 39, 39:01, 39:02, <u>39:04</u> , 39:05, 39:06, 39:13
17	17, 57, 57:01, 57:03, 58
18	18
21	21, 49, 50, 40:05
22	22, 54, 55, 55:01, 55:02, 55:04, 56, 56:01, 56:03
27	27, <u>27:04</u> , <u>27:05</u> , <u>27:06</u> , 27:08
<u>27:04</u>	<u>27:04</u>
27:05	27:05

Candidate Unacceptable B-Locus Antigen	Donor Equivalent Antigens
<u>27:06</u>	<u>27:06</u>
<u>27:08</u>	<u>27:08</u>
35	<u>35, 35:01, 35:02, 35:03, 35:08, 35:12</u>
<u>35:01</u>	<u>35:01</u>
<u>35:02</u>	<u>35:02</u>
<u>35:03</u>	<u>35:03</u>
<u>35:08</u>	<u>35:08</u>
<u>35:12</u>	<u>35:12</u>
37	37
38	<u>38, 38:01, 38:02</u>
<u>38:01</u>	<u>38:01</u>
<u>38:02</u>	<u>38:02</u>
39	<u>39, 39:01, 39:02, 39:04, 39:05, 39:06, 39:13</u>
<u>39:01</u>	<u>39:01</u>
<u>39:02</u>	<u>39:02</u>
<u>39:04</u>	<u>39:04</u>
<u>39:05</u>	<u>39:05</u>
<u>39:06</u>	<u>39:06</u>
<u>39:13</u>	<u>39:13</u>
40	<u>40, 60, 61, 40:01, 40:02, 40:03, 40:04, 40:06</u>
<u>40:01</u>	<u>40:01, 60</u>
<u>40:02</u>	<u>40:02</u>
<u>40:03</u>	<u>40:03</u>
<u>40:04</u>	<u>40:04</u>
<u>40:05</u>	<u>40:05, 60</u>
<u>40:06</u>	<u>40:06</u>
41	<u>41, 41:01, 41:02</u>
<u>41:01</u>	<u>41:01</u>
<u>41:02</u>	<u>41:02</u>
42	<u>42, 42:01, 42:02</u>
<u>42:01</u>	<u>42:01</u>
<u>42:02</u>	<u>42:02</u>
44	<u>44, 44:02, 44:03</u>
<u>44:02</u>	<u>44:02</u>
<u>44:03</u>	<u>44:03</u>
44:05	<u>44:05, 45</u>
45	<u>45, 44:05, 50:02</u>
46	46
47	47
48	<u>48, 48:01, 48:02</u>
<u>48:01</u>	<u>48:01</u>
<u>48:02</u>	<u>48:02</u>
49	49
50	<u>50, 40:05, 50:01, 50:02</u>
<u>50:01</u>	<u>50:01</u>

Candidate Unacceptable B-Locus Antigen	Donor Equivalent Antigens
<u>50:02</u>	<u>50:02, 45</u>
51	51, <u>51:01</u> , <u>51:02</u>
<u>51:01</u>	<u>51:01</u>
<u>51:02</u>	<u>51:02</u>
52	52
53	53
54	54
55	<u>55, 55:01, 55:02, 55:04</u>
<u>55:01</u>	<u>55:01</u>
<u>55:02</u>	<u>55:02</u>
<u>55:04</u>	<u>55:04</u>
56	<u>56, 56:01, 56:03</u>
<u>56:01</u>	<u>56:01</u>
<u>56:03</u>	<u>56:03</u>
57	<u>57, 57:01, 57:03</u>
<u>57:01</u>	<u>57:01</u>
<u>57:03</u>	<u>57:03</u>
58	58
59	59
60	<u>60, 40:01</u>
61	<u>61, 40:02, 40:03, 40:04, 40:06</u>
62	<u>62, 15:01, 15:04, 15:06, 15:07, 15:20, 15:27</u>
63	<u>63, 15:16, 15:17</u>
64	<u>64, 14:01</u>
65	<u>65, 14:02</u>
67	67
70	<u>70, 71, 72, 15:03, 15:10, 15:18</u>
71	<u>71, 15:10, 15:18</u>
72	<u>72, 15:03</u>
73	73
75	<u>75, 15:02, 15:11, 15:21</u>
76	<u>76, 15:12</u>
77	<u>77, 15:13</u>
78	78
81	81
82	82
Bw4	<u>Bw4, 08:02, 08:03, 08:04, 5, 13, 13:01, 13:02, 15:13, 15:16, 15:17, 15:24, 17, 27, 27:04, 27:05, 27:06, 37, 38, 38:01, 38:02, 44, 44:02, 44:03, 44:04, 47, 49, 51, 51:01, 51:02, 52, 53, 57, 57:01, 57:03, 58, 59, 63, 77</u>

Candidate Unacceptable B-Locus Antigen	Donor Equivalent Antigens
Bw6	Bw6, 7, <u>07:02</u> , <u>07:14</u> , 8, <u>08:01</u> , <u>08:04</u> , 14, <u>14:01</u> , <u>14:02</u> , <u>15:01</u> , <u>15:02</u> , <u>15:03</u> , <u>15:04</u> , <u>15:06</u> , <u>15:07</u> , <u>15:10</u> , <u>15:11</u> , <u>15:12</u> , <u>15:18</u> , <u>15:20</u> , <u>15:21</u> , <u>15:27</u> , 18, 22, <u>27:08</u> , 35, <u>35:01</u> , <u>35:02</u> , <u>35:03</u> , <u>35:08</u> , <u>35:12</u> , 39, <u>39:01</u> , <u>39:02</u> , <u>39:04</u> , <u>39:05</u> , <u>39:06</u> , <u>39:13</u> , 40, <u>40:01</u> , <u>40:02</u> , <u>40:03</u> , <u>40:04</u> , <u>40:05</u> , <u>40:06</u> , 41, <u>41:01</u> , <u>41:02</u> , 42, <u>42:01</u> , <u>42:02</u> , 45, 48, <u>48:01</u> , <u>48:02</u> , 50, <u>50:01</u> , <u>50:02</u> , 54, 55, <u>55:01</u> , <u>55:02</u> , <u>55:04</u> , 56, <u>56:01</u> , <u>56:03</u> , 60, 61, 62, 64, 65, 67, 70, 71, 72, 75, 76, 78, 81, 82

Table 4-7: HLA C Unacceptable Antigen Equivalences

Candidate Unacceptable C-Locus Antigen	Donor Equivalent Antigens
01	<u>01</u> , <u>01:02</u> , <u>01:03</u>
<u>01:02</u>	<u>01:02</u>
<u>01:03</u>	<u>01:03</u>
02	<u>02</u> , <u>02:02</u> , <u>02:10</u>
<u>02:02</u>	<u>02:02</u>
<u>02:10</u>	<u>02:10</u>
03	<u>03</u> , <u>03:02</u> , <u>03:03</u> , <u>03:04</u> , <u>03:06</u> , 09, 10
<u>03:02</u>	<u>03:02</u>
<u>03:03</u>	<u>03:03</u>
<u>03:04</u>	<u>03:04</u>
03:06	03:06
04	<u>04</u> , <u>04:01</u> , <u>04:03</u>
<u>04:01</u>	<u>04:01</u>
<u>04:03</u>	<u>04:03</u>
05	05
06	06
07	<u>07</u> , <u>07:01</u> , <u>07:02</u> , <u>07:04</u>
<u>07:01</u>	<u>07:01</u>
<u>07:02</u>	<u>07:02</u>
<u>07:04</u>	<u>07:04</u>
08	<u>08</u> , <u>08:01</u> , <u>08:02</u> , <u>08:03</u> , <u>08:04</u>
<u>08:01</u>	<u>08:01</u>
<u>08:02</u>	<u>08:02</u>
<u>08:03</u>	<u>08:03</u>
<u>08:04</u>	<u>08:04</u>
09	<u>09</u> , <u>03:03</u>
10	<u>10</u> , <u>03:02</u> , <u>03:04</u>
12	<u>12</u> , <u>12:02</u> , <u>12:03</u>
<u>12:02</u>	<u>12:02</u>
<u>12:03</u>	<u>12:03</u>
14	<u>14</u> , <u>14:02</u> , <u>14:03</u>
<u>14:02</u>	<u>14:02</u>
<u>14:03</u>	<u>14:03</u>

Candidate Unacceptable C-Locus Antigen	Donor Equivalent Antigens
15	15, <u>15:02</u> , <u>15:05</u>
<u>15:02</u>	<u>15:02</u>
<u>15:05</u>	<u>15:05</u>
16	16, <u>16:01</u> , <u>16:02</u>
<u>16:01</u>	<u>16:01</u>
<u>16:02</u>	<u>16:02</u>
17	17, <u>17:01</u> , <u>17:03</u>
<u>17:01</u>	<u>17:01</u>
<u>17:03</u>	<u>17:03</u>
18	18, <u>18:01</u> , <u>18:02</u>
<u>18:01</u>	<u>18:01</u>
<u>18:02</u>	<u>18:02</u>

Table 4-8: HLA DR Unacceptable Antigen Equivalences

Candidate Unacceptable DR Locus Antigen	Donor Equivalent Antigens
1	1, <u>01:01</u> , <u>01:02</u> , <u>01:03</u>
<u>01:01</u>	<u>01:01</u>
<u>01:02</u>	<u>01:02</u>
<u>01:03</u>	<u>01:03</u>
403	403
2	2, 15, <u>15:01</u> , <u>15:02</u> , <u>15:03</u> , 16, <u>16:01</u> , <u>16:02</u>
3	3, 17, 18, <u>03:01</u> , <u>03:02</u> , <u>03:03</u>
<u>03:01</u>	<u>03:01</u> , 17
<u>03:02</u>	<u>03:02</u> , 18
<u>03:03</u>	<u>03:03</u> , 18
4	4, <u>04:01</u> , <u>04:02</u> , <u>04:03</u> , <u>04:04</u> , <u>04:05</u> , <u>04:06</u> , <u>04:07</u> , <u>04:10</u> , <u>04:11</u>
<u>04:01</u>	<u>04:01</u>
<u>04:02</u>	<u>04:02</u>
<u>04:03</u>	<u>04:03</u>
<u>04:04</u>	<u>04:04</u>
<u>04:05</u>	<u>04:05</u>
<u>04:06</u>	<u>04:06</u>
<u>04:07</u>	<u>04:07</u>
<u>04:10</u>	<u>04:10</u>
<u>04:11</u>	<u>04:11</u>
5	5, 11, <u>11:01</u> , <u>11:04</u> , 12, <u>12:01</u> , <u>12:02</u>
6	6, 13, <u>13:01</u> , <u>13:02</u> , <u>13:03</u> , 14, <u>14:01</u> , <u>14:02</u> , <u>14:03</u> , <u>14:04</u> , <u>14:05</u> , <u>14:06</u> , <u>14:54</u>
7	7
8	8, <u>08:01</u> , <u>08:02</u> , <u>08:03</u> , <u>08:07</u>
<u>08:01</u>	<u>08:01</u>
<u>08:02</u>	<u>08:02</u>
<u>08:03</u>	<u>08:03</u>
<u>08:07</u>	<u>08:07</u>

Candidate Unacceptable DR Locus Antigen	Donor Equivalent Antigen
9	9, 09:01, 09:02
09:01	09:01
09:02	09:02
10	10
11	11, 11:01, 11:03, 11:04
11:01	11:01
11:03	11:03
11:04	11:04
12	12, 12:01, 12:02
12:01	12:01
12:02	12:02
13	13, 13:01, 13:02, 13:03, 13:05
13:01	13:01
13:02	13:02
13:03	13:03
13:05	13:05
14	14, 14:01, 14:02, 14:03, 14:04, 14:05, 14:06, 14:54
14:01	14:01, 14:54
14:02	14:02
14:03	14:03
14:04	14:04
14:05	14:05
14:06	14:06
14:54	14:54, 14:01
15	15, 15:01, 15:02, 15:03
15:01	15:01
15:02	15:02
15:03	15:03
16	16, 16:01, 16:02
16:01	16:01
16:02	16:02
17	17, 03:01
18	18, 03:02

Table 4-9: HLA DR51 Unacceptable Antigen Equivalences

Candidate Unacceptable DR51-Locus Antigen	Donor Equivalent Antigen
5*01	5*01, 5*01:01, 5*01:02
5*01:01	5*01:01
5*01:02	5*01:02
5*02	5*02, 5*02:02
5*02:02	5*02:02
51	51, 5*01:01, 5*01:02, 5*02:02, 5*01, 5*02

Table 4-10: HLA DR52 Unacceptable Antigen Equivalences

Candidate Unacceptable DR52-Locus Antigen	Donor Equivalent Antigens
<u>3*01</u>	<u>3*01, 3*01:01</u>
3*01:01	3*01:01
<u>3*02</u>	<u>3*02, 3*02:01, 3*02:02</u>
3*02:01	3*02:01
3*02:02	3*02:02
<u>3*03</u>	<u>3*03, 3*03:01</u>
3*03:01	3*03:01
52	52, 3*01:01, 3*02:01, 3*02:02, 3*03:01, 3*01, 3*02, 3*03

Table 4-11: HLA DR53 Unacceptable Antigen Equivalences

Candidate Unacceptable DR-53 Locus Antigen	Donor Equivalent Antigens
<u>4*01</u>	<u>4*01, 4*01:01, 4*01:03</u>
4*01:01	4*01:01
4*01:03	4*01:03
53	53, 4*01:01, 4*01:03, 4*01

Table 4-12: HLA DQA1 Unacceptable Antigen Equivalences

Candidate's Unacceptable DQA1-Locus Antigen	Donor Equivalent Antigens
01	01, 01:01, 01:02, 01:03, 01:04, 01:05, 01:06, 01:07, 01:08, 01:09, 01:10, 01:11, 01:12
01:01	01:01
01:02	01:02
01:03	01:03
01:04	01:04
01:05	01:05
01:06	01:06
01:07	01:07
01:08	01:08
01:09	01:09
01:10	01:10
01:11	01:11
01:12	01:12
02	02, 02:01
02:01	02:01
03	03, 03:01, 03:02, 03:03
03:01	03:01
03:02	03:02
03:03	03:03

Candidate's Unacceptable DQA1 Locus Antigen	Donor Equivalent Antigen
04	04, 04:01, 04:02, 04:04
04:01	04:01
04:02	04:02
04:04	04:04
05	05, 05:01, 05:02, 05:03, 05:04, 05:05, 05:06, 05:07, 05:08, 05:09, 05:10, 05:11
05:01	05:01
05:02	05:02
05:03	05:03
05:04	05:04
05:05	05:05
05:06	05:06
05:07	05:07
05:08	05:08
05:09	05:09
05:10	05:10
05:11	05:11
06	06, 06:01, 06:02
06:01	06:01
06:02	06:02

Table 4-13: HLA DQB1 Unacceptable Antigen Equivalences

Candidate Unacceptable DQB1 Locus Antigen	Donor Equivalent Antigen
1	1, 5, 6, 05:01, 05:02, 06:01, 06:02, 06:03, 06:04, 06:09
2	2, 02:01, 02:02
02:01	02:01
02:02	02:02
3	3, 7, 8, 9, 03:01, 03:02, 03:03, 03:19
03:01	03:01, 7
03:02	03:02, 8
03:03	03:03, 9
03:19	03:19, 7
4	4, 04:01, 04:02
04:01	04:01
04:02	04:02
5	5, 05:01, 05:02, 05:03
05:01	05:01
05:02	05:02
05:03	05:03
6	6, 06:01, 06:02, 06:03, 06:04, 06:09

Candidate Unacceptable DQB1 Locus Antigen	Donor Equivalent Antigen
06:01	06:01
06:02	06:02
06:03	06:03
06:04	06:04
06:09	06:09
7	7, 3, 03:01, 03:19
8	8, 3, 03:02
9	9, 3, 03:03

Table 4-14: HLA DPB1 Unacceptable Antigen Equivalences

Candidate Unacceptable DPB1 Locus Antigen	Donor Equivalent Antigen
<u>01:01</u>	<u>01:01, 162:01, 417:01, 462:01, 616:01</u>
<u>02:01</u>	<u>02:01, 141:01, 352:01, 414:01, 416:01, 461:01, 617:01, 640:01</u>
<u>02:02</u>	<u>02:02, 547:01</u>
<u>03:01</u>	<u>03:01, 104:01, 124:01, 351:01</u>
<u>04:01</u>	<u>04:01, 126:01, 350:01, 415:01, 459:01, 464:01, 534:01, 615:01, 618:01</u>
<u>04:02</u>	<u>04:02, 105:01, 463:01, 571:01, 647:01</u>
<u>05:01</u>	<u>05:01, 135:01</u>
<u>06:01</u>	<u>06:01</u>
<u>08:01</u>	<u>08:01</u>
<u>09:01</u>	<u>09:01</u>
<u>10:01</u>	<u>10:01, 650:01</u>
<u>11:01</u>	<u>11:01, 649:01, 654:01</u>
<u>13:01</u>	<u>13:01, 107:01, 133:01, 518:01, 519:01</u>
<u>14:01</u>	<u>14:01, 498:01, 572:01, 651:01</u>
<u>15:01</u>	<u>15:01, 585:01</u>
<u>16:01</u>	<u>16:01, 652:01, 653:01</u>
<u>17:01</u>	<u>17:01, 131:01, 168:01, 460:01</u>
<u>18:01</u>	<u>18:01</u>
<u>19:01</u>	<u>19:01, 106:01, 533:01, 535:01</u>
<u>20:01</u>	<u>20:01</u>
<u>21:01</u>	<u>21:01</u>
<u>22:01</u>	<u>22:01</u>
<u>23:01</u>	<u>23:01, 138:01</u>
<u>24:01</u>	<u>24:01</u>
<u>25:01</u>	<u>25:01</u>
<u>26:01</u>	<u>26:01</u>
<u>27:01</u>	<u>27:01</u>

<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
<u>28:01</u>	<u>28:01, 296:01</u>
<u>29:01</u>	<u>29:01</u>
<u>30:01</u>	<u>30:01</u>
<u>31:01</u>	<u>31:01</u>
<u>32:01</u>	<u>32:01</u>
<u>33:01</u>	<u>33:01</u>
<u>34:01</u>	<u>34:01</u>
<u>35:01</u>	<u>35:01</u>
<u>36:01</u>	<u>36:01</u>
<u>37:01</u>	<u>37:01</u>
<u>38:01</u>	<u>38:01</u>
<u>39:01</u>	<u>39:01, 584:01</u>
<u>40:01</u>	<u>40:01</u>
<u>41:01</u>	<u>41:01</u>
<u>44:01</u>	<u>44:01</u>
<u>45:01</u>	<u>45:01</u>
<u>46:01</u>	<u>46:01</u>
<u>47:01</u>	<u>47:01</u>
<u>48:01</u>	<u>48:01</u>
<u>49:01</u>	<u>49:01</u>
<u>50:01</u>	<u>50:01</u>
<u>51:01</u>	<u>51:01</u>
<u>52:01</u>	<u>52:01</u>
<u>53:01</u>	<u>53:01</u>
<u>54:01</u>	<u>54:01</u>
<u>55:01</u>	<u>55:01</u>
<u>56:01</u>	<u>56:01</u>
<u>57:01</u>	<u>57:01, 648:01</u>
<u>58:01</u>	<u>58:01</u>
<u>59:01</u>	<u>59:01</u>
<u>60:01</u>	<u>60:01</u>
<u>62:01</u>	<u>62:01</u>
<u>63:01</u>	<u>63:01</u>
<u>65:01</u>	<u>65:01</u>
<u>66:01</u>	<u>66:01</u>
<u>67:01</u>	<u>67:01</u>
<u>68:01</u>	<u>68:01</u>
<u>69:01</u>	<u>69:01</u>

<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
<u>70:01</u>	<u>70:01</u>
<u>71:01</u>	<u>71:01</u>
<u>72:01</u>	<u>72:01</u>
<u>73:01</u>	<u>73:01</u>
<u>74:01</u>	<u>74:01</u>
<u>75:01</u>	<u>75:01</u>
<u>76:01</u>	<u>76:01</u>
<u>77:01</u>	<u>77:01</u>
<u>78:01</u>	<u>78:01</u>
<u>79:01</u>	<u>79:01</u>
<u>80:01</u>	<u>80:01</u>
<u>81:01</u>	<u>81:01</u>
<u>82:01</u>	<u>82:01</u>
<u>83:01</u>	<u>83:01</u>
<u>84:01</u>	<u>84:01</u>
<u>85:01</u>	<u>85:01</u>
<u>86:01</u>	<u>86:01</u>
<u>87:01</u>	<u>87:01</u>
<u>88:01</u>	<u>88:01</u>
<u>89:01</u>	<u>89:01</u>
<u>90:01</u>	<u>90:01</u>
<u>91:01</u>	<u>91:01</u>
<u>92:01</u>	<u>92:01</u>
<u>93:01</u>	<u>93:01</u>
<u>94:01</u>	<u>94:01</u>
<u>95:01</u>	<u>95:01</u>
<u>96:01</u>	<u>96:01</u>
<u>97:01</u>	<u>97:01</u>
<u>98:01</u>	<u>98:01</u>
<u>99:01</u>	<u>99:01</u>
<u>100:01</u>	<u>100:01</u>
<u>101:01</u>	<u>101:01</u>
<u>102:01</u>	<u>102:01</u>
<u>103:01</u>	<u>103:01</u>
<u>104:01</u>	<u>104:01</u>
<u>105:01</u>	<u>105:01</u>
<u>106:01</u>	<u>106:01</u>
<u>107:01</u>	<u>107:01</u>

<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
<u>108:01</u>	<u>108:01</u>
<u>109:01</u>	<u>109:01</u>
<u>110:01</u>	<u>110:01</u>
<u>111:01</u>	<u>111:01</u>
<u>112:01</u>	<u>112:01</u>
<u>113:01</u>	<u>113:01</u>
<u>114:01</u>	<u>114:01</u>
<u>115:01</u>	<u>115:01</u>
<u>116:01</u>	<u>116:01</u>
<u>117:01</u>	<u>117:01</u>
<u>118:01</u>	<u>118:01</u>
<u>119:01</u>	<u>119:01</u>
<u>121:01</u>	<u>121:01</u>
<u>122:01</u>	<u>122:01</u>
<u>123:01</u>	<u>123:01</u>
<u>124:01</u>	<u>124:01</u>
<u>125:01</u>	<u>125:01</u>
<u>126:01</u>	<u>126:01</u>
<u>127:01</u>	<u>127:01</u>
<u>128:01</u>	<u>128:01</u>
<u>129:01</u>	<u>129:01</u>
<u>130:01</u>	<u>130:01</u>
<u>131:01</u>	<u>131:01</u>
<u>132:01</u>	<u>132:01</u>
<u>133:01</u>	<u>133:01</u>
<u>134:01</u>	<u>134:01</u>
<u>135:01</u>	<u>135:01</u>
<u>136:01</u>	<u>136:01</u>
<u>137:01</u>	<u>137:01</u>
<u>138:01</u>	<u>138:01</u>
<u>139:01</u>	<u>139:01</u>
<u>140:01</u>	<u>140:01</u>
<u>141:01</u>	<u>141:01</u>
<u>142:01</u>	<u>142:01</u>
<u>143:01</u>	<u>143:01</u>
<u>144:01</u>	<u>144:01</u>
<u>145:01</u>	<u>145:01</u>
<u>146:01</u>	<u>146:01</u>

<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
<u>147:01</u>	<u>147:01</u>
<u>148:01</u>	<u>148:01</u>
<u>149:01</u>	<u>149:01</u>
<u>150:01</u>	<u>150:01</u>
<u>151:01</u>	<u>151:01</u>
<u>152:01</u>	<u>152:01</u>
<u>153:01</u>	<u>153:01</u>
<u>155:01</u>	<u>155:01</u>
<u>156:01</u>	<u>156:01</u>
<u>157:01</u>	<u>157:01</u>
<u>158:01</u>	<u>158:01</u>
<u>160:01</u>	<u>160:01</u>
<u>162:01</u>	<u>162:01</u>
<u>163:01</u>	<u>163:01</u>
<u>164:01</u>	<u>164:01</u>
<u>165:01</u>	<u>165:01</u>
<u>166:01</u>	<u>166:01</u>
<u>167:01</u>	<u>167:01</u>
<u>168:01</u>	<u>168:01</u>
<u>169:01</u>	<u>169:01</u>
<u>170:01</u>	<u>170:01</u>
<u>171:01</u>	<u>171:01</u>
<u>172:01</u>	<u>172:01</u>
<u>173:01</u>	<u>173:01</u>
<u>174:01</u>	<u>174:01</u>
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<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
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<u>568:01</u>	<u>568:01</u>
<u>569:01</u>	<u>569:01</u>
<u>571:01</u>	<u>571:01</u>
<u>572:01</u>	<u>572:01</u>
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<u>578:01</u>	<u>578:01</u>
<u>579:01</u>	<u>579:01</u>

<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
<u>580:01</u>	<u>580:01</u>
<u>581:01</u>	<u>581:01</u>
<u>582:01</u>	<u>582:01</u>
<u>583:01</u>	<u>583:01</u>
<u>584:01</u>	<u>584:01</u>
<u>585:01</u>	<u>585:01</u>
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<u>616:01</u>	<u>616:01</u>
<u>617:01</u>	<u>617:01</u>
<u>618:01</u>	<u>618:01</u>

<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
<u>619:01</u>	<u>619:01</u>
<u>620:01</u>	<u>620:01</u>
<u>621:01</u>	<u>621:01</u>
<u>622:01</u>	<u>622:01</u>
<u>623:01</u>	<u>623:01</u>
<u>624:01</u>	<u>624:01</u>
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<u>628:01</u>	<u>628:01</u>
<u>629:01</u>	<u>629:01</u>
<u>630:01</u>	<u>630:01</u>
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<u>656:01</u>	<u>656:01</u>

<u>Candidate Unacceptable DPB1 Locus Antigen</u>	<u>Donor Equivalent Antigen</u>
<u>658:01</u>	<u>658:01</u>
<u>659:01</u>	<u>659:01</u>
<u>660:01</u>	<u>660:01</u>
<u>662:01</u>	<u>662:01</u>
<u>663:01</u>	<u>663:01</u>
<u>664:01</u>	<u>664:01</u>

Table 4-14 4-15: Additional Unacceptable Antigen Equivalences to be used in the Calculated Panel Reactive Antibody (CPRA) Only

Locus	Patient Unacceptable Antigen	Unacceptable DR antigen equivalences used for CPRA calculation
DR51	5*01:01	2, 15, 16
	<u>5*01:02</u>	<u>2, 15, 16</u>
	5*02:02	2, 15, 16
	51	2, 15, 16
DR52	3*01:01	3, 5, 6, 11, 12, 13, 14, 17, 18
	<u>3*02:01</u>	<u>3, 5, 6, 11, 12, 13, 14, 17, 18</u>
	3*02:02	3, 5, 6, 11, 12, 13, 14, 17, 18
	3*03:01	3, 5, 6, 11, 12, 13, 14, 17, 18
	52	3, 5, 6, 11, 12, 13, 14, 17, 18
DR53	4*01:01	4, 7, 9
	4*01:03	4, 7, 9
	53	4, 7, 9

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