OPTN

Report to the OPTN Board of Directors on

Update Human Leukocyte Antigen (HLA) Equivalency Tables, 2023

OPTN Histocompatibility Committee

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Contents

Executive Summary	2
Purpose	3
Background	3
Overview of Approved Proposal	3
Overall Sentiment from Public Comment	6
Compliance Analysis	7
Implementation Considerations	10
Post-implementation Monitoring	11
Conclusion	12
Policy Language	13

Update Human Leukocyte Antigen (HLA) Equivalency Tables, 2023

Affected Policies:	*4.11.A: HLA Matching Equivalences* *4.11.B: HLA Unacceptable Antigen Equivalences* *4.11.C: HLA DPB1 Available Alleles*
Sponsoring Committee:	*Histocompatibility*
Public Comment Period:	*July 27, 2023—September 19, 2023*
Final Approval Date:	*Anticipated by November 14, 2023*

Executive Summary

OPTN *Policy 4.10: HLA Value Updates* requires the OPTN Histocompatibility Committee (Committee) to review the Human Leukocyte Antigen (HLA) equivalency tables listed in OPTN *Policy 4.11: Reference Tables of HLA Antigen Values and Split Equivalences* on an annual basis and recommend any changes needed. The OPTN Board of Directors (Board) approved the most recent recommended table update in December 2021 with implementation following in August 2022.[1] During their 2023 annual review, the Committee identified changes needed to better ensure safety, equity, and accuracy in matching donors with transplant candidates. The changes are:

1. Add all Immuno Polymorphism Database-International ImMunoGeneTics (IPD-IMGT) HLA P-groups that contain more than a single two-field allele for HLA typings and unacceptable antigen equivalences for all loci.
2. Update HLA matching equivalences to more equitably incorporate higher resolution HLA typings by making all HLA typings within a serologic antigen group match each other.
3. Update HLA-DPB1 tables to IPD-IMGT/HLA version 3.52.0 to ensure that the unacceptable antigen screening for candidates will appropriately exclude incompatible donors based on current P-group equivalences and epitopes, without changing requirements for candidate, donor, or recipient HLA typing.

The Committee utilized the expedited actions pathway for these updates, pursuant to OPTN *Policy 4.10: HLA Value Updates* and OPTN *Bylaw 11.8: Expedited Actions*.

[1] OPTN Histocompatibility Committee, "Briefing to the OPTN Board of Directors on Update Human Leukocyte Antigen (HLA) Equivalency Tables," December 2021. https://optn.transplant.hrsa.gov/media/4vjluojl/20211206-bp-histo-update-hla-equivalency-tbl.pdf.

Purpose

The Committee conducted their required annual review of the HLA equivalency tables and identified the following areas of change:

1. Add all Immuno Polymorphism Database-International ImMunoGeneTics (IPD-IMGT) HLA P-groups that contain more than a single two-field allele for HLA typings and unacceptable antigen equivalences for all loci.
2. Update HLA matching equivalences to more equitably incorporate higher resolution HLA typings by making all HLA typings within a serologic antigen group match each other.
3. Update HLA-DPB1 tables to IPD-IMGT/HLA version 3.52.0 to ensure that the unacceptable antigen screening for candidates will appropriately exclude incompatible donors based on current P-group equivalences and epitopes, without changing requirements for candidate, donor, or recipient HLA typing.

Background

Human Leukocyte Antigens (HLA) are used in transplant to assess donor organ suitability for a particular candidate. Matching HLA typings between a donor and recipient at certain loci can lead to increased graft survival. Avoiding HLA alleles to which a candidate is sensitized decreases chances of acute and chronic rejection and can also decrease required immunosuppression doses. Histocompatibility and Immunogenetics is a rapidly evolving field, with increasing resolution of HLA typing as well as increasing research into the causes and prevention of sensitization and rejection.

OPTN *Policy 4.10: HLA Value Updates* requires the OPTN Histocompatibility Committee (Committee) to review HLA equivalency tables listed in OPTN *Policy 4.11: Reference Tables of HLA Antigen Values and Split Equivalences* on an annual basis and recommend any changes needed. During the 2021 annual HLA equivalency tables review the committee identified changes to be made based on current nomenclature, clinical practice, and testing abilities, as well as aligned HLA donor and transplant candidate data collection across the OPTN Computer System. The OPTN Board of Directors approved the most recent recommended table update in December 2021[2] with implementation following in August 2022. The Committee completed its most recent review in Spring 2023.

Overview of Approved Proposal

Addition of P-Groups

The Immuno Polymorphism Database-International ImMunoGeneTics (IPD-IMGT) HLA Nomenclature for Factors of the HLA System Committee defined P-groups as Class I alleles with identical protein sequences in exons 2 and 3, and Class II alleles with identical protein sequences in exon 2.[3, 4] These are generally the primary peptide binding domains for these antigens.[5] Incomplete genomic sequences,

[2] Id.
[3] WHO Nomenclature Committee for Factors of the HLA System. https://hla.alleles.org/alleles/p_groups.html. Accessed June 5, 2023.
[4] Class I loci include HLA-A, B, Bw4, Bw6, and C. Class II loci include DQA1, DQB1, DRB1, DR51, DR52, DR53, DPA1, and DPB1.
[5] Cruz-Tapias P, Castiblanco J, Anaya JM. Major histocompatibility complex: Antigen processing and presentation. In: Anaya JM, Shoenfeld Y, Rojas-Villarraga A, et al., editors. Autoimmunity: From Bench to Bedside. Bogota (Colombia): El Rosario University Press; 2013 Jul 18. Chapter 10. Available from: https://www.ncbi.nlm.nih.gov/books/NBK459467/.

such as occur in null alleles, are excluded from P-groups.[6] While the OPTN has structured HLA-DPB1 unacceptable antigen equivalencies using P-group equivalences for a number of years, the nomenclature was not incorporated and the rest of the HLA tables have not utilized P-group typings.

While there are multiple methodologies for Next Generation Sequencing (NGS) typing, the most common ambiguities are related to exclusion of distal exons for certain loci or incomplete characterization of all regions during amplification,[7] both of which can be resolved to a P-group level typing. Incorporation of P-groups will allow for higher resolution HLA typings to be incorporated into the OPTN Computer System, without incorporating all IMGT/HLA alleles at this time.

The Committee had considered including all common alleles as defined by Common, Intermediate, and Well-Documented (CIWD) HLA Alleles version 3.0,[8] but had felt that there were some limitations to that study. In addition, they had considered adding more IMGT/HLA available alleles but had felt that may be premature or overwhelming due to the added data entry complexity.

Adding P-group level typing to the OPTN Computer System will facilitate more precise compatibility screening, potentially lowering the number of unexpected positive crossmatches, and thus lowering the risk of not being able to transplant an accepted organ. Incorporation of P-group level typing also helps to increase precision of HLA screening, allowing programs to better assess immunologic incompatibility of a donor organ with the potential candidate, which helps to avoid the risk of adverse post-transplant events such as acute or chronic rejection.

The Committee discussed adding P-group equivalences to allele-specific equivalences as a post-public comment change. They reviewed allele-specific unacceptable antigen listing practices and epitopes that were shared and different across P-group alleles to inform their decision. Ultimately, they decided not to include the change in this proposal, but to consider it as a future change.

Update HLA Matching Tables

This proposal will also update the HLA matching tables for the A, B, and DR loci. Currently, two different alleles within the same serologic antigen only match their parent serologic antigen, not each other, as the equivalences were designed for serologic antigen-level deceased donor HLA typings. This has been the typing resolution available for deceased donors for the past few decades, due to long turnaround times for higher resolution HLA typings because of technologic limitations. Updating the equivalences would mean that candidates with rarer alleles, such as those from smaller minority groups, will maintain their current priority for HLA matching as higher resolution deceased donor HLA typings are implemented. Traditionally, donors have been typed at the serologic antigen level, so there would be no candidate impact, but with increasing typing capabilities for deceased donors the timing is appropriate for this update. Incorporation of alleles into HLA matching began in September 2017.[9] Until recently, high-resolution HLA typing was not feasible in the timeframe necessary for deceased donor

[6] Id.
[7] Timothy L. Mosbruger et al. Utilizing nanopore sequencing technology for the rapid and comprehensive characterization of eleven HLA loci; addressing the need for deceased donor expedited HLA typing, Human Immunology. Volume 81, Issue 8, 2020, https://doi.org/10.1016/j.humimm.2020.06.004.
[8] Hurley, Carolyn K., Jane Kempenich, Kim Wadsworth, Jürgen Sauter, Jan A. Hofmann, Daniel Schefzyk, Alexander H. Schmidt, et al. "Common, Intermediate and Well-documented HLA Alleles in World Populations: CIWD Version 3.0.0." *HLA* 95, no. 6 (2020): 516–31. https://doi.org/10.1111/tan.13811.
[9] https://optn.transplant.hrsa.gov/policies-bylaws/public-comment/update-hla-equivalency-tables/.

transplantation.[10,11] In order to maintain the same matching structure and candidate equity while still incorporating more higher-resolution HLA typing values and allowing for deceased donors to be typed at higher resolutions, the Committee updated the matching tables so that all HLA values within a serologic antigen group are equivalent to each other. For example, A*01:01 is proposed to match A*01:02, whereas beforehand it would only match itself and A1. However, deceased donors have been typed at the serologic antigen level, A1 in this example, so donors with an A*01:02 allele would only have been reported as A1 previously. Updating the tables to allow A*01:01 to match A*01:02 maintains the current substantive function of the HLA matching structure, while incorporating higher resolution HLA values.

The Committee had considered allele-level, epitope-level, and P-group-level HLA matching. Since not all deceased donors will be typed at higher resolution at this time, higher resolution HLA matching is not feasible at this time. In addition, candidates with rarer alleles, such as those from smaller minority groups, with rarer HLA typings, may be disadvantaged in allele-level matching. And lastly, based on the lack of high-resolution deceased donor typing data in the OPTN Computer System, modeling for allocation policies has been done based almost solely on antigen-level equivalences. Due to the lack of higher resolution donor HLA typing data, none of the alternative approaches were able to be modeled at a national level, to evaluate impacts on both graft survival and candidate equity.

These updates are not expected to change the number of 0-ABDR mismatches or 0-1 DR mismatch transplants, as they do not change the function of the current matching algorithm. The updates only more equitably incorporate higher resolution HLA typings.

The Committee did not recommend any changes to this portion of the proposal following public comment.

Update DPB1 Tables

The Committee updated HLA-DPB1 to keep HLA typing and unacceptable antigens aligned with current practice. The changes update DPB1 equivalences, epitopes, and reportable values in OPTN Policy to be current with the IPD-IMGT/HLA version 3.52.0, with all non-null allele values included.[12] The previous equivalences are based on IPD-IMGT/HLA version 3.44.0. This will update the values within the OPTN Computer System, but will not change requirements for HLA typing, candidate screening, candidate Calculated Panel Reactive Antibody (CPRA), or HLA matching for allocation. It will also ensure that the unacceptable antigen screening for candidates will appropriately exclude incompatible donors based on current P-group equivalences and epitopes. The Committee did not recommend any changes to this portion of the proposal following public comment.

Expedited Updates Pathway

The changes to the HLA equivalency tables were made using the expedited actions pursuant to OPTN *Policy 4.10: HLA Value Updates* and OPTN *Bylaw 11.8: Expedited Actions*. The eligibility of OPTN *Policy 4.11: Reference Tables of HLA Antigen Values and Split Equivalences* for this pathway was approved in

[10] De Santis, Dianne, Linh Truong, Patricia Martinez, and Lloyd D'Orsogna. "Rapid High-resolution HLA Genotyping by MinION Oxford Nanopore Sequencing for Deceased Donor Organ Allocation." *HLA* 96, no. 2 (2020): 141–62. https://doi.org/10.1111/tan.13901.

[11] Edgerly CH, Weimer ET. The Past, Present, and Future of HLA Typing in Transplantation. Methods Mol Biol. 2018;1802:1-10. doi: 10.1007/978-1-4939-8546-3_1. PMID: 29858798.

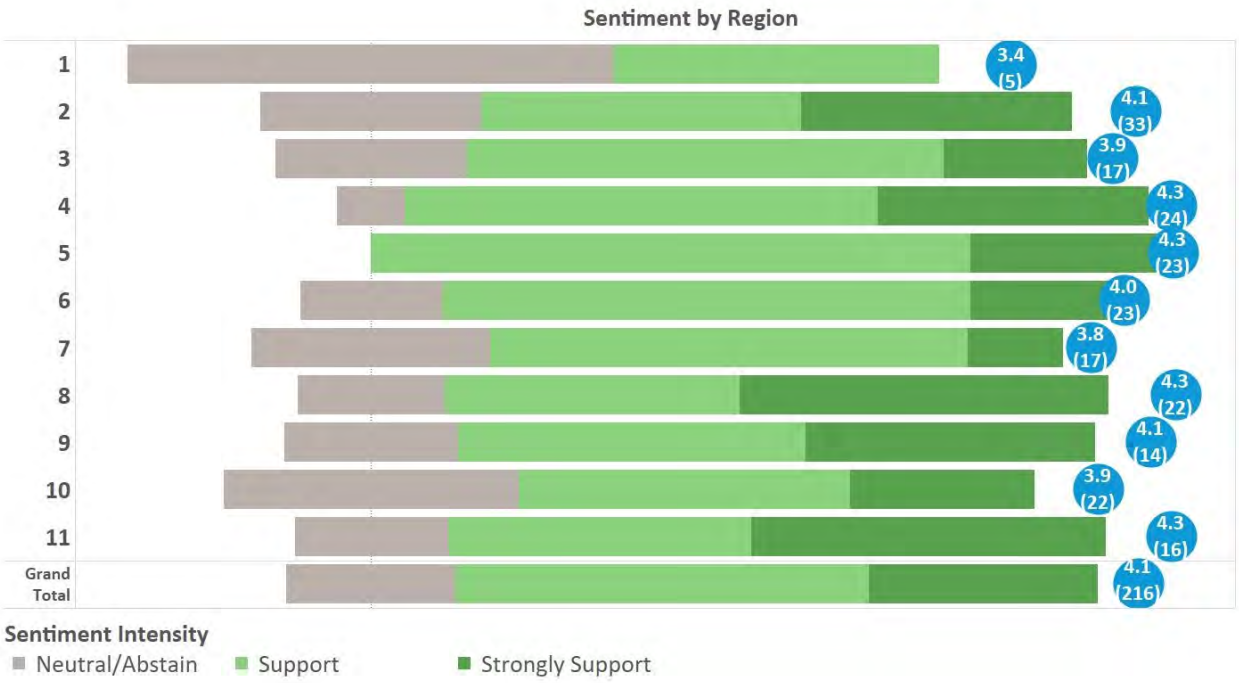
[12] https://www.ebi.ac.uk/ipd/imgt/hla/docs/release.html.

June 2020 by the OPTN Board of Directors (Board).[13] The Committee considered public comments and recommended the final adoption of the proposal without requiring Board approval. The proposal would not have been eligible for expedited action if five members of the general public, one OPTN Committee, or four members of the Board objected to its use. Since no objections were raised during public comment, the proposal is eligible to become effective upon notice to OPTN members, or in this case at a later date as the proposal requires technical implementation.

Overall Sentiment from Public Comment

This proposal was released for public comment from July 27, 2023 to September 19, 2023. This proposal received a total of 231 comments, seven of which included a written comment in addition to sentiment. Sentiment by region is shown in **Figure 1**, and the majority of sentiment was submitted through regional meetings. This proposal was on the consent agenda in all 11 meetings, but participants did have the option of submitting additional comments via a polling application to be included in the regional summary. Overall this proposal was supported in public comment, with an average Likert score of 4.1/5.[14]

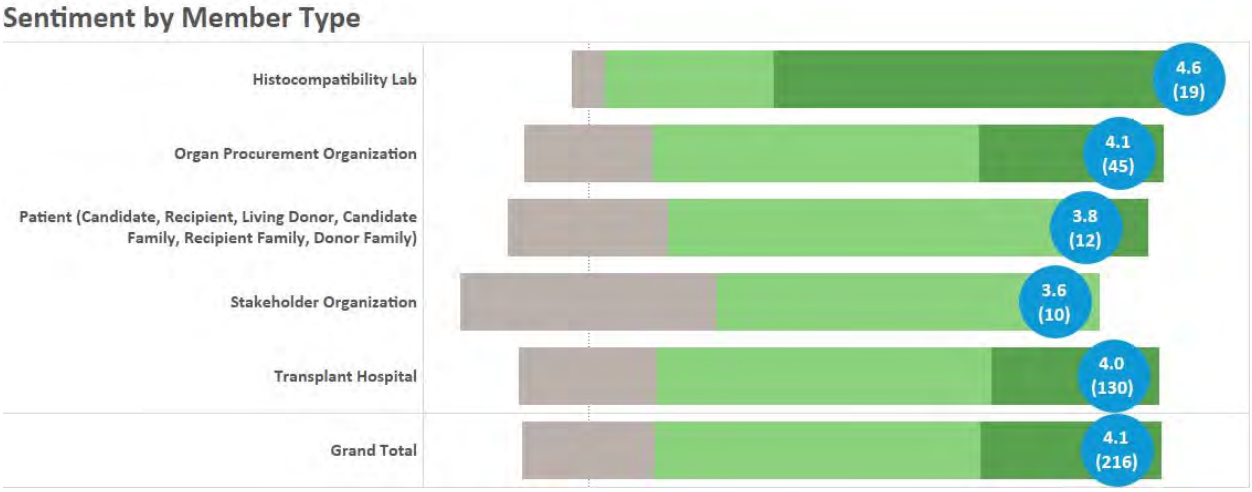
Figure 1: Sentiment by Region



This proposal was broadly supported by all member types, with the most support coming from histocompatibility laboratory members, with an average Likert score[15] of 4.6/5. Sentiment by member type is available in **Figure 2**.

[13] https://optn.transplant.hrsa.gov/media/3839/2020-06_histo_policy_notice.pdf.
[14] Sentiment is collected along a 5-point Likert scale from strongly oppose to strongly support (1-5).
[15] Sentiment is collected along a 5-point Likert scale from strongly oppose to strongly support (1-5).

Figure 2: Sentiment by Member Type



All written comments were in support of the proposal. Only one theme outside of general support arose due to the low number of written comments. Multiple commenters recommended updating the tables to all IMGT/HLA molecular nomenclature and removing older nomenclature, but this was out of scope of the current proposal. Another commenter also commented on the serological equivalents in the table versus shared eplet sequences, but this was also out of the scope of the current proposal.

Compliance Analysis

NOTA and OPTN Final Rule

The Committee approved the proposal under the authority of the National Organ Transplantation Act, which states, "The Organ Procurement and Transplantation Network shall… (A) establish… (ii) a national system… to match organs and individuals included in the list, especially individuals whose immune system makes it difficult for them to receive organs…"[16] An increase in the number of available HLA typing options should allow for better assessment of a candidate's immunologic compatibility with a potential donor. Additional HLA reporting should most greatly benefit sensitized candidates.

The Committee also approved the proposal under the authority of the OPTN Final Rule, which states, "An organ procurement organization or transplant hospital shall, as specified from time to time by the Secretary, submit to the OPTN…information regarding transplant candidates, transplant recipients, [and] donors of organs…."[17] The OPTN shall "maintain records of all transplant candidates, all organ donors and all transplant recipients"[18] and shall "…receive…such records and information electronically…"[19] This proposal will allow the OPTN to collect more precise HLA data on living and deceased donors and donor organs, and maintain such data in the OPTN dataset.

The Committee also approved the following proposal under the authority of the OPTN Final Rule, which states "The OPTN Board of Directors shall be responsible for developing…policies for the equitable

[16] 42 USC §274(b)(2)(A)(ii).
[17] 42 CFR §121.11(b)(2).
[18] 42 CFR §121.11(a)(1)(ii).
[19] 42 CFR §121.11(a)(1)(iii).

allocation for cadaveric organs."[20] This proposal may affect allocation, as candidate and donor HLA typings are used for matching purposes in kidney, pancreas, and lung allocation.[21] In addition, donor HLA typings are used to screen incompatible candidates from a match for all organ types.

The Final Rule requires that when developing policies for the equitable allocation of cadaveric organs, such policies must be developed "in accordance with §121.8," which requires that allocation policies "(1) Shall be based on sound medical judgment; (2) Shall seek to achieve the best use of donated organs; (3) Shall preserve the ability of a transplant program to decline an offer of an organ or not to use the organ for the potential recipient in accordance with §121.7(b)(4)(d) and (e); (4) Shall be specific for each organ type or combination of organ types to be transplanted into a transplant candidate; (5) Shall be designed to avoid wasting organs, to avoid futile transplants, to promote patient access to transplantation, and to promote the efficient management of organ placement;…(8) Shall not be based on the candidate's place of residence or place of listing, except to the extent required by paragraphs (a)(1)-(5) of this section."[22] This proposal:

- **Is based on sound medical judgment[23]** because it is an evidence-based change relying on peer-reviewed literature and the Committee's collective clinical experience. Additionally, the proposed changes were made to align the tables with the IPD-IMGT HLA Database project. The IPD-IMGT/HLA database is a repository for sequences of the human major histocompatibility complex (MHC). This database is updated several times each year. HLA value changes in this proposal use version 3.52.0 released in April 2023.
- **Is designed to avoid futile transplants[24]:** This proposal allows for better assessment of transplant immunologic risk, benefitting post-transplant outcomes.
    - Proposed changes help to increase precision of HLA screening, allowing programs to better assess immunologic incompatibility of a donor organ with the potential candidate, which helps to avoid the risk of adverse post-transplant events such as acute or chronic rejection.
- **Is designed to…promote patient access to transplantation[25]** by giving similarly situated candidates equitable opportunities to receive an organ offer.
    - Proposed changes ensure that higher resolution deceased donor HLA typings will still match all candidates within the same serologic antigen group. This ensures that candidates with rarer HLA types, such as smaller minority groups, are not disadvantaged by the increased use of higher resolution HLA typing methodologies prior to deceased donor match runs. Maintaining matching within the serologic antigen group with higher resolution donor HLA typings preserves the likelihood of finding an HLA-matched donor for those in smaller minority groups.[26]
- **Is designed to avoid wasting organs[27]** by decreasing the number of organs recovered but not transplanted

[20] 42 CFR §121.4(a)(1).
[21] OPTN *Policy 8.3: Kidney Allocation Score*; OPTN *Policy 11.5: Pancreas, Kidney-Pancreas, and Islet Allocation Classifications and Rankings.*
[22] 42 CFR §121.8(a).
[23] 42 CFR §121.8(a)(1).
[24] 42 CFR §121.8(a)(5).
[25] Ibid.
[26] Beatty PG, Mori M, Milford E. Impact of racial genetic polymorphism on the probability of finding an HLA-matched donor. Transplantation. 1995 Oct;60(8):778-783. PMID: 7482734.
[27] 42 CFR §121.8(a)(5).

    - Adding P-group level typing to the OPTN Computer System would facilitate more precise compatibility screening, potentially lowering the number of unexpected positive crossmatches, and thus lowering the risk of not being able to transplant an accepted organ.
- **Promotes the efficient management of organ placement**[28] by avoiding unexpected positive crossmatches.
    - Proposed changes help to increase the precision of HLA typings, allowing programs to better assess immunologic incompatibility of a donor organ with the potential candidate. This allows for a more precise HLA initial screening by programs, as well as a more precise automated HLA screening based on unacceptable antigens, helping avoid unexpected positive crossmatches.
- **Seeks to achieve the best use of donated organs**[29] by increasing donor screening to better assess transplant immunologic compatibility and better titrate post-transplant immunosuppression.
    - Proposed changes help to increase precision of HLA screening, allowing programs to better assess immunologic risk of the donor organ. This allows programs to better assess candidate suitability and titrate post-transplant immunosuppression, helping increase chances for long-term graft survival.
- **Is not based on a candidate's place of residence or place of listing except to the extent required by other regulatory requirements.**[30]
    - Increasing and updating the reportable HLA is not dependent on a candidate's place of residence or place of listing.

This proposal also preserves the ability of a transplant program to decline an offer or not use the organ for a potential recipient,[31] and it is specific to each organ type for which HLA reporting for donors and candidates is applicable.[32]

The OPTN Final Rule also requires the OPTN to consider **"whether to adopt transition procedures that would treat people on the waiting list and awaiting transplantation prior to the adoption or effective date of the revised policies no less favorably than they would have been treated under the previous policies."**[33] Upon consideration of whether there would be any populations treated less favorably, it was determined that the proposed changes will not affect any patient population more or less favorably when receiving organ offers. HLA A, B, and DR matching equivalences are being updated to utilize emerging technologies without changing the practical application of the matching functions. Candidate unacceptable antigen screening will be updated in line with current practice and current known immunocompatibility. Candidates who would now be screened off of a match run due to the equivalency tables updates would not have been able to accept the offer due to immunologic incompatibility prior to this update.

[28] 42 CFR §121.8(a)(5).
[29] 42 CFR §121.8(a)(2).
[30] 42 CFR §121.8(a)(8).
[31] 42 CFR §121.8(a)(3).
[32] 42 CFR §121.8(a)(4).
[33] 42 CFR §121.8(d).

OPTN Strategic Plan

1. *Increase the number of transplants:*
   This proposal increases the efficiency of unacceptable antigen screening for sensitized candidates by increasing the granularity of HLA typing and unacceptable antigen options in the OPTN Computer System. This allows for a better systems assessment of immunologic incompatibility, reducing the number of potentially incompatible organ offers requiring manual review.

2. *Improve equity in access to transplants:*
   This proposal increases the precision of HLA typing in the OPTN Computer System, allowing for additional, more precise unacceptable antigens and HLA typings, ensuring highly sensitized candidates aren't being unnecessarily screened from match runs. In addition, it updates the HLA matching tables to equitably incorporate higher resolution HLA typings for deceased donors, preserving access to HLA matching prioritization for candidates in smaller minority groups who may have HLA alleles less common in the broader deceased donor population.

Implementation Considerations

Histocompatibility Laboratories

Operational Considerations

Laboratories will need to update any Application Programming Interfaces (APIs) implemented to reflect changes in this proposal. Laboratories may need to update their Laboratory Informatics Systems (LISs).

Fiscal Impact

Histocompatibility laboratories may incur minimal costs associated with upgrades to existing computer systems and APIs.

Organ Procurement Organizations

Operational Considerations

OPOs may need to evaluate their agreements with histocompatibility laboratories to accommodate any needed transactional changes related to the proposal changes.

Fiscal Impact

There is minimal to no expected fiscal impact for OPOs.

Transplant Programs

Operational Considerations

Transplant hospitals may need to evaluate their agreements with histocompatibility laboratories to accommodate any needed transactional changes related to the proposal changes.

Fiscal Impact

There is minimal to no expected impact for transplant hospitals.

OPTN

Operational Considerations

This proposal will involve information technology (IT) implementation efforts in the OPTN Computer System. IT implementation would support the change in policy related by adding additional HLA typing options, additional HLA equivalences, and modifying the HLA matching tables used within the match function.

The OPTN will need to update the relevant policies on the OPTN website, as well as communicate the proposed changes to the transplant community and monitor the changes after implementation.

Resource Estimates

This proposal will require an estimated 3900 hours of IT technical implementation in the OPTN Computer System. IT implementation would support the change in policy related by adding additional HLA typing options, additional HLA equivalences, and modifying the HLA matching tables used within the match function. This will also include regression testing of the match function.

Post-implementation Monitoring

Member Compliance

The Final Rule requires that allocation policies "include appropriate procedures to promote and review compliance including, to the extent appropriate, prospective and retrospective reviews of each transplant program's application of the policies to patients listed or proposed to be listed at the program."[34]

The proposed language will not change the current routine monitoring of OPTN members. Any data entered in the OPTN Computer System may be reviewed by the OPTN, and members are required to provide documentation as requested.

Policy Evaluation

The Final Rule requires that allocation policies "be reviewed periodically and revised as appropriate."[35] The Committee will evaluate changes in CPRA values due to revisions of unacceptable antigen equivalences immediately after the implementation compared to values immediately prior to the implementation.

[34] 42 CFR §121.8(a)(7).
[35] 42 CFR §121.8(a)(6).

The committee intends through this policy change, there will be an adoption of the utilization of P-groups in typing after their addition. The following metrics, and any others subsequently requested by the Committee, will be evaluated as data become available to compare reporting before and after the implementation of this policy:

1. Utilization of P-group typing for deceased donors
2. The number and percentage of offers refused due to a positive crossmatch

These metrics will be evaluated at approximately one- and two-years post-implementation.

Conclusion

The Committee conducted their required annual review of the HLA equivalency tables and identified the following changes needed as proposed:

1. Add all IPD-IMGT HLA P-groups that contain more than a single two-field allele for HLA typings and unacceptable antigen equivalences for all loci.
4. Update HLA matching equivalences to more equitably incorporate higher resolution HLA typings by making all HLA typings within a serologic antigen group match each other.
2. Update HLA-DPB1 tables to IPD-IMGT/HLA version 3.52.0 to ensure that the unacceptable antigen screening for candidates will appropriately exclude incompatible donors based on current P-group equivalences and epitopes, without changing requirements for candidate, donor, or recipient HLA typing.

The Committee utilized the expedited actions pathway for these updates, pursuant to OPTN *Policy 4.10: HLA Value Updates* and OPTN *Bylaw 11.8: Expedited Actions*. There is no action required of the OPTN Board of Directors.

Policy Language

Proposed new language is underlined (example) and language that is proposed for removal is struck through (~~example~~). Heading numbers, table and figure captions, and cross-references affected by the numbering of these policies will be updated as necessary.

4.11.A: HLA Matching Equivalences

Tables 4-2, 4-3, and *4-4* show candidate-donor antigen equivalencies. ~~For each candidate serologic antigen listed below, a~~All of the candidate and donor antigens that are considered equivalent to each other for the purposes of HLA matching are listed ~~beside the candidate antigen~~ within each row. All other combinations are considered mismatches for the purposes of HLA matching.

Table 4-2: HLA A Matching Antigen Equivalences

~~Candidate A-Locus Antigen~~	~~Equivalent~~ Candidate and Donor A-Locus Antigens Equivalent to Each Other
~~1~~	1, 01:01P, 01:01, 01:02P, 01:02, 01:03P
~~01:01~~	~~01:01, 1~~
~~01:02~~	~~01:02, 1~~
~~2~~	2, 02:01P, 02:01, 02:02P, 02:02, 02:03P, 02:03, 02:04P, 02:05P, 02:05, 02:06P, 02:06, 02:07P, 02:07, 02:10P, 02:10, 02:11P, 02:14P, 02:16P, 02:18, 02:20P, 02:22P, 02:29P, 02:49P, 02:65P, 02:81P
~~02:01~~	~~02:01, 2~~
~~02:02~~	~~02:02, 2~~
~~02:03~~	~~02:03, 2~~
~~02:05~~	~~02:05, 2~~
~~02:06~~	~~02:06, 2~~
~~02:07~~	~~02:07, 2~~
~~02:10~~	~~02:10, 2~~
~~02:18~~	~~02:18, 2~~
~~3~~	3, 03:01P, 03:01, 03:02P, 03:02, 03:04P, 32:04
~~03:01~~	~~03:01, 3~~
~~03:02~~	~~03:02, 3~~
~~9~~	9
~~10~~	10
~~11~~	11, 11:01P, 11:01, 11:02P, 11:02, 11:03P, 11:05P
~~11:01~~	~~11:01, 11~~
~~11:02~~	~~11:02, 11~~
~~19~~	19
~~23~~	23, 23:01P

~~Candidate A-Locus Antigen~~	~~Equivalent~~ Candidate and Donor A-Locus Antigens Equivalent to Each Other
~~24~~	24, 24:02P, 24:02, 24:03P, 24:03, 24:05P, 24:07P, 24:10P, 24:26P
~~24:02~~	~~24:02, 24~~
~~24:03~~	~~24:03, 24~~
~~25~~	25, 25:01P
~~26~~	26, 26:01P, 26:01, 26:02, 26:03P, 26:03
~~26:01~~	~~26:01, 26~~
~~26:02~~	~~26:02, 26~~
~~26:03~~	~~26:03, 26~~
~~28~~	28
~~29~~	29, 29:01P, 29:01, 29:02P, 29:02
~~29:01~~	~~29:01, 29~~
~~29:02~~	~~29:02, 29~~
~~30~~	30, 30:01P, 30:01, 30:02P, 30:02, 30:04P
~~30:01~~	~~30:01, 30~~
~~30:02~~	~~30:02, 30~~
~~31~~	31, 31:01P
~~32~~	32, 32:01P
~~32:04~~	~~32:04, 3~~
~~33~~	33, 33:01P, 33:01, 33:03P, 33:03
~~33:01~~	~~33:01, 33~~
~~33:03~~	~~33:03, 33~~
~~34~~	34, 34:01P, 34:01, 34:02
~~34:01~~	~~34:01, 34~~
~~34:02~~	~~34:02, 34~~
~~36~~	36, 36:01P
~~43~~	43
~~66~~	66, 66:01P, 66:01, 66:02P, 66:02
~~66:01~~	~~66:01, 66~~
~~66:02~~	~~66:02, 66~~
~~68~~	68, 68:01P, 68:01, 68:02P, 68:02, 68:03P
~~68:01~~	~~68:01, 68~~
~~68:02~~	~~68:02, 68~~
~~69~~	69
~~74~~	74, 74:01P, 74:06P
~~80~~	80, 80:01P

Table 4-3: HLA B Matching Antigen Equivalences

~~Candidate B-Locus Antigen~~	~~Equivalent~~ Candidate and Donor B-Locus Antigens Equivalent to Each Other
~~5~~	5
~~7~~	7, 07:02P, 07:02, 07:03, 07:05P, 07:14
~~07:02~~	~~07:02, 7~~
~~07:03~~	~~07:03, 7~~
~~07:14~~	~~07:14, 7~~
~~8~~	8, 08:01P, 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, 13:01P, 13:01, 13:02P, 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~~
~~15:17~~	~~15:17, 63~~
~~15:18~~	~~15:18, 71~~
~~15:20~~	~~15:20, 62~~
~~15:21~~	~~15:21, 75~~
~~15:24~~	~~15:24~~
~~15:27~~	~~15:27, 62~~
~~16~~	16
~~17~~	17
~~18~~	18, 18:01P
~~21~~	21
~~22~~	22

~~Candidate B-Locus Antigen~~	~~Equivalent~~ Candidate and Donor B-Locus Antigens Equivalent to Each Other
~~27~~	27, 27:02P, 27:03, 27:04P, 27:04, 27:05P, 27:05, 27:06P, 27:06, 27:07P
~~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, 35:01P, 35:01, 35:02P, 35:02, 35:03P, 35:03, 35:05P, 35:08P, 35:14P, 35:08, 35:12P, 35:12, 35:43P, 35:137P
~~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, 37:01P
~~38~~	38, 38:01P, 38:01, 38:02P, 38:02
~~38:01~~	~~38:01, 38~~
~~38:02~~	~~38:02, 38~~
~~39~~	39, 39:01P, 39:01, 39:02P, 39:02, 39:03P, 39:04, 39:05P, 39:05, 39:06P, 39:06, 39:09P, 39:10P, 39:13, 39:15P
~~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, 40:40P, 40:213P
~~40:01~~	~~40:01, 60~~
~~40:02~~	~~40:02, 61~~
~~40:03~~	~~40:03, 61~~
~~40:04~~	~~40:04, 61~~
~~40:05~~	~~40:05, 50~~
~~40:06~~	~~40:06, 61~~
~~41~~	41, 41:01P, 41:01, 41:02P, 41:02
~~41:01~~	~~41:01, 41~~
~~41:02~~	~~41:02, 41~~
~~42~~	42, 42:01P, 42:01, 42:02
~~42:01~~	~~42:01, 42~~
~~42:02~~	~~42:02, 42~~
~~44~~	44, 44:02P, 44:02, 44:03P, 44:03, 44:05P, 44:29P, 44:53P, 51:42P
~~44:02~~	~~44:02, 44~~
~~44:03~~	~~44:03, 44~~

~~Candidate B-Locus Antigen~~	~~Equivalent~~ Candidate and Donor B-Locus Antigens Equivalent to Each Other
~~45~~	45, 45:01P, 50:02P, 50:02
~~46~~	46, 46:01P
~~47~~	47, 47:01P
~~48~~	48, 48:01P, 48:01, 48:02, 48:04P
~~48:01~~	~~48:01, 48~~
~~48:02~~	~~48:02, 48~~
~~49~~	49, 49:01P
~~50~~	50, 50:01P, 50:01, 40:05
~~50:01~~	~~50:01, 50~~
~~50:02~~	~~50:02, 45~~
~~51~~	51, 51:01P, 51:01, 51:02, 51:08P, 51:09P, 51:143P
~~51:01~~	~~51:01, 51~~
~~51:02~~	~~51:02, 51~~
~~52~~	52, 52:01P
~~53~~	53, 53:01P
~~54~~	54, 54:01P
~~55~~	55, 55:01P, 55:01, 55:02P, 55:02, 55:04
~~55:01~~	~~55:01, 55~~
~~55:02~~	~~55:02, 55~~
~~55:04~~	~~55:04, 55~~
~~56~~	56, 56:01P, 56:01, 56:03
~~56:01~~	~~56:01, 56~~
~~56:03~~	~~56:03, 56~~
~~57~~	57, 57:01P, 57:01, 57:03P, 57:03
~~57:01~~	~~57:01, 57~~
~~57:03~~	~~57:03, 57~~
~~58~~	58, 58:01P, 58:02P
~~59~~	59, 59:01P
~~60~~	60, 40:01P, 40:01
~~61~~	61, 40:02P, 40:02, 40:03P, 40:03, 40:04, 40:06P, 40:06
~~62~~	62, 15:01P, 15:01, 15:04, 15:06, 15:07P, 15:07, 15:20P, 15:20, 15:25P, 15:27, 15:28P, 15:30P, 15:32P, 15:35P, 15:39P
~~63~~	63, 15:16P, 15:16, 15:17P, 15:17
~~64~~	64, 14:01P, 14:01
~~65~~	65, 14:02P, 14:02
~~67~~	67, 67:01P
~~70~~	70, 15:123P
~~71~~	71, 15:10P, 15:10, 15:18P, 15:18
~~72~~	72, 15:03P, 15:03
~~73~~	73, 73:01P
~~75~~	75, 15:02P, 15:02, 15:11P, 15:11, 15:21P, 15:21
~~76~~	76, 15:12P, 15:12, 15:14P

~~Candidate B-Locus Antigen~~	~~Equivalent~~ Candidate and Donor B-Locus Antigens Equivalent to Each Other
~~77~~	77, 15:13, 15:24
~~78~~	78
~~81~~	81, 81:01P
~~82~~	82
~~83:01~~	83:01

Table 4-4: HLA DR Matching Antigen Equivalences

~~Candidate DR-Locus Antigen~~	~~Equivalent~~ Candidate and Donor DR-Locus Antigens Equivalent to Each Other
~~1~~	1, 01:01P, 01:01, 01:02P, 01:02
~~01:01~~	~~01:01, 1~~
~~01:02~~	~~01:02, 1~~
~~01:03~~	~~01:03, 103~~
~~2~~	2
~~3~~	3~~, 03:01P, 03:01, 03:02P, 03:02, 03:03~~
~~03:01~~	~~03:01, 17~~
~~03:02~~	~~03:02, 18~~
~~03:03~~	~~03:03, 18~~
4	4, 04:01P, 04:01, 04:02P, 04:02, 04:03P, 04:03, 04:04P, 04:04, 04:05P, 04:05, 04:06P, 04:06, 04:07P, 04:07, 04:08P, 04:10P, 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, 07:01P
~~8~~	8, 08:01P, 08:01, 08:02P, 08:02, 08:03P, 08:03, 08:04P, 08:07
~~08:01~~	~~08:01, 8~~
~~08:02~~	~~08:02, 8~~
~~08:03~~	~~08:03, 8~~
~~08:07~~	~~08:07, 8~~
~~9~~	9, 09:01P, 09:01, 09:02
~~09:01~~	~~09:01, 9~~
~~09:02~~	~~09:02, 9~~

~~Candidate DR-Locus Antigen~~	~~Equivalent~~ Candidate and Donor DR-Locus Antigens Equivalent to Each Other
~~10~~	10, 10:01P
~~11~~	11, 11:01P, 11:01, 11:02P, 11:03P, 11:03, 11:04P, 11:04, 11:06P, 11:11P
~~11:01~~	~~11:01, 11~~
~~11:03~~	~~11:03, 11~~
~~11:04~~	~~11:04, 11~~
~~12~~	12, 12:01P, 12:01, 12:02P, 12:02
~~12:01~~	~~12:01, 12~~
~~12:02~~	~~12:02, 12~~
~~13~~	13, 13:01P, 13:01, 13:02P, 13:02, 13:03P, 13:03, 13:05, 13:12P
~~13:01~~	~~13:01, 13~~
~~13:02~~	~~13:02, 13~~
~~13:03~~	~~13:03, 13~~
~~13:05~~	~~13:05, 13~~
~~14~~	14, 14:01P, 14:01, 14:02P, 14:02, 14:03P, 14:03, 14:04P, 14:04, 14:05, 14:06, 14:08P, 14:24P, 14:54
~~14:01~~	~~14:01, 14, 14:54~~
~~14:02~~	~~14:02, 14~~
~~14:03~~	~~14:03, 14~~
~~14:04~~	~~14:04, 14~~
~~14:05~~	~~14:05, 14~~
~~14:06~~	~~14:06, 14~~
~~14:54~~	~~14:54, 14, 14:01~~
~~15~~	15, 15:01P, 15:01, 15:02P, 15:02, 15:03P, 15:03, 15:04P, 15:07P
~~15:01~~	~~15:01, 15~~
~~15:02~~	~~15:02, 15~~
~~15:03~~	~~15:03, 15~~
~~16~~	16, 16:01P, 16:01, 16:02P, 16:02
~~16:01~~	~~16:01, 16~~
~~16:02~~	~~16:02, 16~~
~~17~~	17, 03:01P, 03:01
~~18~~	18, 03:02P, 03:02, 03:03
~~103~~	103, 01:03P, 01:03

4.11.B: HLA Unacceptable Antigen Equivalences

At the time of the match run, if an antigen or epitope is entered as unacceptable for a candidate, then the candidate will not appear on the match run for donors reported with any of the equivalent antigens described in *Tables 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-13, 4-14, 4-15,* and *4-16* below.

CPRA calculations include all donor alleles equivalent to a candidate's reported unacceptable antigens, alleles, and epitopes.

HLA values listed below as equivalent for the purposes of unacceptable antigen screening are also equivalent for the purposes of reporting HLA typing, with the exception of epitope-based unacceptable antigen assignments in the *Table 4-16.*

Table 4-5: HLA A Unacceptable Antigen Equivalences

If this A-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
1	1, 01:01P, 01:01, 01:02P, 01:02, 01:03P
01:01	01:01
01:02	01:02
2	2, 02:01P, 02:01, 02:02P, 02:02, 02:03P, 02:03, 02:04P, 02:05P, 02:05, 02:06P, 02:06, 02:07P, 02:07, 02:10P, 02:10, 02:11P, 02:14P, 02:16P, 02:18, 02:20P, 02:22P, 02:29P, 02:49P, 02:65P, 02:81P
02:01	02:01
02:02	02:02
02:03	02:03
02:05	02:05
02:06	02:06
02:07	02:07
02:10	02:10
02:18	02:18
3	3, 03:01P, 03:01, 03:02P, 03:02, 03:04P, 32:04
03:01	03:01
03:02	03:02
9	9, 23, 23:01P, 24, 24:02P, 24:02, 24:03P, 24:03, 24:05P, 24:07P, 24:10P, 24:26P
10	10, 25, 25:01P, 26, 26:01P, 26:01, 26:02, 26:03P, 26:03, 34, 34:01P, 34:01, 34:02, 66, 66:01P, 66:01, 66:02P, 66:02, 43
11	11, 11:01P, 11:01, 11:02P, 11:02, 11:03P, 11:05P
11:01	11:01
11:02	11:02
19	19, 29, 29:01P, 29:01, 29:02P, 29:02, 30, 30:01P, 30:01, 30:02P, 30:02, 30:04P, 31, 31:01P, 32, 32:01P, 33, 33:01P, 33:01, 33:03P, 33:03, 74, 74:01P, 74:06P
23	23, 23:01P

If this A-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
24	24, 24:02P, 24:02, 24:03P, 24:03, 24:05P, 24:07P, 24:10P, 24:26P
24:02	24:02
24:03	24:03
25	25, 25:01P
26	26, 26:01P, 26:01, 26:02, 26:03P, 26:03
26:01	26:01
26:02	26:02
26:03	26:03
28	28, 68, 69, 68:01P, 68:01, 68:02P, 68:02, 68:03P
29	29, 29:01P, 29:01, 29:02P, 29:02
29:01	29:01
29:02	29:02
30	30, 30:01P, 30:01, 30:02P, 30:02, 30:04P
30:01	30:01
30:02	30:02
31	31, 31:01P
32	32, 32:01P
32:04	32:04
33	33, 33:01P, 33:01, 33:03P, 33:03
33:01	33:01
33:03	33:03
34	34, 34:01P, 34:01, 34:02
34:01	34:01
34:02	34:02
36	36, 36:01P
43	43
66	66, 66:01P, 66:01, 66:02P, 66:02
66:01	66:01
66:02	66:02
68	68, 68:01P, 68:01, 68:02P, 68:02, 68:03P
68:01	68:01
68:02	68:02
69	69
74	74, 74:01P, 74:06P
80	80, 80:01P

Table 4-6 HLA B Unacceptable Antigen Equivalences

If this B-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
5	5, 51, 51:01P, 51:01, 51:02, 51:08P, 51:09P, 51:143P, 52, 52:01P
7	7, 07:02P, 07:02, 07:03, 07:05P, 07:14
07:02	07:02
07:03	07:03
07:14	07:14
8	8, 08:01P, 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, 44:02P, 44:02, 44:03P, 44:03, 44:05P, 44:29P, 44:53P, 51:42P, 45, 50:02P, 50:02
13	13, 13:01P, 13:01, 13:02P, 13:02
13:01	13:01
13:02	13:02
14	14, 64, 65, 14:01P, 14:01, 14:02P, 14:02
14:01	14:01, 64
14:02	14:02, 65
15	15, 62, 63, 70, 71, 72, 75, 76, 77, 15:01P, 15:01, 15:02P, 15:02, 15:03P, 15:03, 15:04, 15:06, 15:07P, 15:07, 15:10P, 15:10, 15:11P, 15:11, 15:12P, 15:12, 15:13, 15:14P, 15:16P, 15:16, 15:17P, 15:17, 15:18P, 15:18, 15:20P, 15:20, 15:21P, 15:21, 15:24, 15:25P, 15:27, 15:28P, 15:30P, 15:32P, 15:35P, 15:39P, 15:123P
15:01	15:01
15:02	15:02
15:03	15:03
15:04	15:04
15:06	15:06
15:07	15:07
15:10	15:10
15:11	15:11
15:12	15:12
15:13	15:13
15:16	15:16
15:17	15:17
15:18	15:18
15:20	15:20
15:21	15:21
15:24	15:24
15:27	15:27

If this B-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
16	16, 38, 38:01P, 38:01, 38:02P, 38:02, 39, 39:01P, 39:01, 39:02P, 39:02, 39:03P, 39:04, 39:05P, 39:05, 39:06P, 39:06, 39:09P, 39:10P, 39:13, 39:15P
17	17, 57, 57:01P, 57:01, 57:03P, 57:03, 58, 58:01P, 58:02P
18	18, 18:01P
21	21, 49, 49:01P, 50, 40:05, 50:01P, 50:01
22	22, 54, 54:01P, 55, 55:01P, 55:01, 55:02P, 55:02, 55:04, 56, 56:01P, 56:01, 56:03
27	27, 27:02P, 27:03, 27:04P, 27:04, 27:05P, 27:05, 27:06P, 27:06, 27:07P
27:03	27:03
27:04	27:04
27:05	27:05
27:06	27:06
27:08	27:08
35	35, 35:01P, 35:01, 35:02P, 35:02, 35:03P, 35:03, 35:05P, 35:08P, 35:08, 35:12 35:14P, 35:43P, 35:137P
35:01	35:01
35:02	35:02
35:03	35:03
35:08	35:08
35:12	35:12
37	37, 37:01P
38	38, 38:01P, 38:01, 38:02P, 38:02
38:01	38:01
38:02	38:02
39	39, 39:01P, 39:01, 39:02P, 39:02, 39:03P, 39:04, 39:05P, 39:05, 39:06P, 39:06, 39:09P, 39:10P, 39:13, 39:15P
39:01	39:01
39:02	39:02
39:04	39:04
39:05	39:05
39:06	39:06
39:13	39:13
40	40, 60, 61, 40:01P, 40:01, 40:02P, 40:02, 40:03P, 40:03, 40:04, 40:06P, 40:06, 40:40P, 40:213P
40:01	40:01
40:02	40:02
40:03	40:03
40:04	40:04
40:05	40:05
40:06	40:06
41	41, 41:01P, 41:01, 41:02P, 41:02

If this B-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
41:01	41:01
41:02	41:02
42	42, 42:01P, 42:01, 42:02
42:01	42:01
42:02	42:02
44	44, 44:02P, 44:02, 44:03P, 44:03, 44:05P, 44:29P, 44:53P, 51:42P
44:02	44:02
44:03	44:03
45	45, 45:01P, 50:02P, 50:02
46	46, 46:01P
47	47, 47:01P
48	48, 48:01P, 48:01, 48:02, 48:04P
48:01	48:01
48:02	48:02
49	49, 49:01P
50	50, 40:05, 50:01P, 50:01
50:01	50:01
50:02	50:02
51	51, 51:01P, 51:01, 51:02, 51:08P, 51:09P, 51:143P
51:01	51:01
51:02	51:02
52	52, 52:01P
53	53, 53:01P
54	54, 54:01P
55	55, 55:01P, 55:01, 55:02P, 55:02, 55:04
55:01	55:01
55:02	55:02
55:04	55:04
56	56, 56:01P, 56:01, 56:03
56:01	56:01
56:03	56:03
57	57, 57:01P, 57:01, 57:03P, 57:03
57:01	57:01
57:03	57:03
58	58, 58:01P, 58:02P
59	59, 59:01P
60	60, 40:01P, 40:01
61	61, 40:02P, 40:02, 40:03P, 40:03, 40:04, 40:06P, 40:06
62	62, 15:01P, 15:01, 15:04, 15:06, 15:07P, 15:07, 15:20P, 15:20, 15:25P, 15:27, 15:28P, 15:30P, 15:32P, 15:35P, 15:39P
63	63, 15:16P, 15:16, 15:17P, 15:17
64	64, 14:01P, 14:01

If this B-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
65	65, 14:02P, 14:02
67	67, 67:01P
70	70, 71, 72, 15:03P, 15:03, 15:10P, 15:10, 15:18P, 15:18, 15:123P
71	71, 15:10P, 15:10, 15:18P, 15:18
72	72, 15:03P, 15:03
73	73, 73:01P
75	75, 15:02P, 15:02, 15:11P, 15:11, 15:21P, 15:21
76	76, 15:12P, 15:12, 15:14P
77	77, 15:13
78	78
81	81, 81:01P
82	82
83:01	83:01
Bw4	Bw4, 08:02, 08:03, 5, 13, 13:01P, 13:01, 13:02P, 13:02, 15:13, 15:16P, 15:16, 15:17P, 15:17, 15:24, 17, 27, 27:02P, 27:03, 27:04P, 27:04, 27:05P, 27:05, 27:06P, 27:06, 27:07P, 37, 37:01P, 38, 38:01P, 38:01, 38:02P, 38:02, 44, 44:02P, 44:02, 44:03P, 44:03, 44:05P, 44:29P, 44:53P, 47, 47:01P, 49, 49:01P, 51, 51:01P, 51:01, 51:02, 51:08P, 51:09P, 51:42P, 51:143P, 52, 52:01P, 53, 53:01P, 57, 57:01P, 57:01, 57:03P, 57:03, 58, 58:01P, 58:02P, 59, 59:01P, 63, 77
Bw6	Bw6, 7, 07:02P, 07:02, 07:03, 07:05P, 07:14, 8, 08:01P, 08:01, 08:04, 14, 14:01P, 14:01, 14:02P, 14:02, 15:01P, 15:01, 15:02P, 15:02, 15:03P, 15:03, 15:04, 15:06, 15:07P, 15:07, 15:10P, 15:10, 15:11P, 15:11, 15:12P, 15:12, 15:14P, 15:18P, 15:18, 15:20P, 15:20, 15:21P, 15:21, 15:25P, 15:27, 15:28P, 15:30P, 15:32P, 15:35P, 15:39P, 15:123P, 18, 18:01P, 22, 27:08, 35, 35:01P, 35:01, 35:02P, 35:02, 35:03P, 35:03, 35:05P, 35:08P, 35:08, 35:12P, 35:12, 35:14P, 35:43P, 35:137P, 39, 39:01P, 39:01, 39:02P, 39:02, 39:03P, 39:04, 39:05P, 39:05, 39:06P, 39:06, 39:09P, 39:10P, 39:13, 39:15P, 40, 40:01P, 40:01, 40:02P, 40:02, 40:03P, 40:03, 40:04, 40:05, 40:06P, 40:06, 40:40P, 40:213P, 41, 41:01P, 41:01, 41:02P, 41:02, 42, 42:01P, 42:01, 42:02, 45, 45:01P, 48, 48:01P, 48:01 48:02, 48:04P, 50, 50:01P, 50:01, 50:02P, 50:02, 54, 54:01P, 55, 55:01P, 55:01, 55:02P, 55:02, 55:04, 56, 56:01P, 56:01, 56:03, 60, 61, 62, 64, 65, 67, 67:01P, 70, 71, 72, 75, 76, 78, 81, 81:01P, 82

Table 4-7: HLA C Unacceptable Antigen Equivalences

If this C-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
01	01, 01:02P, 01:02, 01:03P, 01:03, 01:63P
01:02	01:02
01:03	01:03
02	02, 02:02P, 02:02, 02:10, 02:14P, 02:16P, 02:134P, 02:159P, 02:182P
02:02	02:02
02:10	02:10
03	03, 03:02P, 03:02, 03:03P, 03:03, 03:04P, 03:04, 03:05P, 03:05, 03:06, 03:14P, 03:40P, 09, 10
03:02	03:02
03:03	03:03
03:04	03:04
03:05	03:05
03:06	03:06
04	04, 04:01P, 04:01, 04:03P, 04:03, 04:04, 04:06P, 04:07, 04:10P, 04:59P, 04:355P, 04:360P
04:01	04:01
04:03	04:03
04:04	04:04
04:07	04:07
05	05, 05:01P, 05:01
05:01	05:01
06	06, 06:02P, 06:02, 06:06P, 06:87P
06:02	06:02
07	07, 07:01P, 07:01, 07:02P, 07:02, 07:04P, 07:04, 07:06, 07:18, 07:19P, 07:22P, 07:26P, 07:27P, 07:28P, 07:165P, 07:450P, 07:919P
07:01	07:01
07:02	07:02
07:04	07:04
07:06	07:06
07:18	07:18
08	08, 08:01P, 08:01, 08:02P, 08:02, 08:03P, 08:03, 08:04
08:01	08:01
08:02	08:02
08:03	08:03
08:04	08:04
09	09, 03:03P, 03:03
10	10, 03:02P, 03:02, 03:04P, 03:04, 03:06
12	12, 12:02P, 12:02, 12:03P, 12:03, 12:04, 12:14P
12:02	12:02

If this C-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
12:03	12:03
12:04	12:04
14	14, 14:02P, 14:02, 14:03P, 14:03
14:02	14:02
14:03	14:03
15	15, 15:02P, 15:02, 15:04P, 15:04, 15:05P, 15:05, 15:06, 15:09, 15:103P
15:02	15:02
15:04	15:04
15:05	15:05
15:06	15:06
15:09	15:09
16	16, 16:01P, 16:01, 16:02P, 16:02, 16:04, 16:15P
16:01	16:01
16:02	16:02
16:04	16:04
17	17, 17:01P, 17:01, 17:03
17:01	17:01
17:03	17:03
18	18, 18:01P, 18:01, 18:02
18:01	18:01
18:02	18:02

Table 4-8: HLA DR Unacceptable Antigen Equivalences

If this DR-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
1	1, 01:01P, 01:01, 01:02P, 01:02
01:01	01:01
01:02	01:02
01:03	01:03, 103
2	2, 15, 15:01P, 15:01, 15:02P, 15:02, 15:03P, 15:03, 15:04P, 15:07P, 16, 16:01P, 16:01, 16:02P, 16:02
3	3, 17, 18, 03:01P, 03:01, 03:02P, 03:02, 03:03
03:01	03:01
03:02	03:02
03:03	03:03
4	4, 04:01P, 04:01, 04:02P, 04:02, 04:03P, 04:03, 04:04P, 04:04, 04:05P, 04:05, 04:06P, 04:06, 04:07P, 04:07, 04:08P, 04:10P, 04:10, 04:11
04:01	04:01
04:02	04:02

If this DR-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
04:03	04:03
04:04	04:04
04:05	04:05
04:06	04:06
04:07	04:07
04:10	04:10
04:11	04:11
5	5, 11, 11:01P, 11:01, 11:02P, 11:03P, 11:04P, 11:04, 11:06P, 11:11P, 12, 12:01P, 12:01, 12:02P, 12:02
6	6, 13, 13:01P, 13:01,13:02P, 13:02, 13:03P, 13:03, 13:05, 13:12P, 14, 14:01P, 14:01, 14:02P, 14:02, 14:02P, 14:03, 14:04P, 14:04, 14:05, 14:06, 14:08P, 14:24P, 14:54
7	7, 07:01P
8	8, 08:01P, 08:01, 08:02P, 08:02, 08:03P, 08:03, 08:04P, 08:07
08:01	08:01
08:02	08:02
08:03	08:03
08:07	08:07
9	9, 09:01P, 09:01, 09:02
09:01	09:01
09:02	09:02
10	10, 10:01P
11	11, 11:01P, 11:01, 11:02P, 11:03P, 11:03, 11:04P, 11:04, 11:06P, 11:11P
11:01	11:01
11:03	11:03
11:04	11:04
12	12, 12:01P, 12:01, 12:02P, 12:02
12:01	12:01
12:02	12:02
13	13, 13:01P, 13:01, 13:02P, 13:02, 13:03P, 13:03, 13:05, 13:12P
13:01	13:01
13:02	13:02
13:03	13:03
13:05	13:05
14	14, 14:01P, 14:01, 14:02P, 14:02, 14:03P, 14:03, 14:04P, 14:04, 14:05, 14:06, 14:08P, 14:24P, 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

If this DR-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
14:54	14:54~~, 14:01~~
15	15, 15:01P, 15:01, 15:02P, 15:02, 15:03P, 15:03, 15:04P, 15:07P
15:01	15:01
15:02	15:02
15:03	15:03
16	16, 16:01P, 16:01, 16:02P, 16:02
16:01	16:01
16:02	16:02
17	17, 03:01P, 03:01
18	18, 03:02P, 03:02, 03:03
103	103, 01:03P, 01:03

Table 4-9: HLA DR51 Unacceptable Antigen Equivalences

If this DR51-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
5*01	5*01, 5*01:01P, 5*01:01, 5*01:02P, 5*01:02
5*01:01	5*01:01
5*01:02	5*01:02
5*02	5*02, 5*02:02P, 5*02:02
5*02:02	5*02:02
51	51, 5*01:01P, 5*01:01, 5*01:02P, 5*01:02, 5*02:02P, 5*02:02, 5*01, 5*02

Table 4-10: HLA DR52 Unacceptable Antigen Equivalences

If this DR52-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigens:
3*01	3*01, 3*01:01P, 3*01:01
3*01:01	3*01:01
3*02	3*02, 3*02:01P, 3*02:01, 3*02:02P, 3*02:02, 3*02:100P
3*02:01	3*02:01
3*02:02	3*02:02
3*03	3*03, 3*03:01P, 3*03:01, 3*03:22P
3*03:01	3*03:01
52	52, 3*01:01P, 3*01:01, 3*02:01P, 3*02:01, 3*02:02P, 3*02:02, 3*02:100P, 3*03:01P, 3*03:01, 3*03:22P, 3*01, 3*02, 3*03

Table 4-11: HLA DR53 Unacceptable Antigen Equivalences

If this DR-53 Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
4*01	4*01, 4*01:01P, 4*01:01, 4*01:03, 4*01:75P, 4*01:78P
4*01:01	4*01:01
4*01:03	4*01:03
53	53, 4*01:01P, 4*01:01, 4*01:03, 4*01:75P, 4*01:78P, 4*01

Table 4-12: HLA DQA1 Unacceptable Antigen Equivalences

If this DQA1-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
01	01, 01:01P, 01:01, 01:02P, 01:02, 01:03P, 01:03, 01:04, 01:05, 01:06, 01:07P, 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, 02:01P, 02:01
02:01	02:01
03	03, 03:01P, 03:01, 03:02, 03:03
03:01	03:01
03:02	03:02
03:03	03:03
04	04, 04:01P, 04:01, 04:02, 04:04
04:01	04:01
04:02	04:02
04:04	04:04

If this DQA1-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
05	05, 05:01P, 05:01, 05:02, 05:03, 05:04, 05:05, 05:06, 05:07, 05:08, 05:09, 05:10, 05:11, 05:23P
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, 06:01P, 06:01, 06:02
06:01	06:01
06:02	06:02

Table 4-13: HLA DQB1 Unacceptable Antigen Equivalences

If this DQB1-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
2	2, 02:01P, 02:01, 02:02, 02:03P, 02:57P, 02:135P
02:01	02:01
02:02	02:02
3	3, 7, 8, 9, 03:01P, 03:01, 03:02P, 03:02, 03:03P, 03:03, 03:04P, 03:05P, 03:10P, 03:19, 03:71P, 03:113P
03:01	03:01
03:02	03:02
03:03	03:03
03:19	03:19
4	4, 04:01P, 04:01, 04:02P, 04:02
04:01	04:01
04:02	04:02
5	5, 05:01P, 05:01, 05:02P, 05:02, 05:03P, 05:03, 05:04P
05:01	05:01
05:02	05:02
05:03	05:03

If this DQB1-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
6	6, 06:01P, 06:01, 06:02P, 06:02, 06:03P, 06:03, 06:04P, 06:04, 06:08P, 06:09P, 06:09, 06:46P, 06:92P
06:01	06:01
06:02	06:02
06:03	06:03
06:04	06:04
06:09	06:09
7	7, 03:01P, 03:01, 03:04P, 03:19
8	8, 03:02P, 03:02, 03:05P, 03:10P
9	9, 03:03P, 03:03

Table 4-14: HLA DPA1 Unacceptable Antigen Equivalences

If this DPA1-Locus Unacceptable Antigen is reported:	The following HLA values are considered equivalent to the reported unacceptable antigen:
01	01, 01:03P, 01:03, 01:04, 01:05P, 01:05, 01:06, 01:07, 01:08, 01:09, 01:10, 01:11, 01:12
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, 02:01P, 02:01,02:02P, 02:02, 02:03, 02:04, 02:07, 02:21P, 02:54P
02:01	02:01
02:02	02:02
02:03	02:03
02:04	02:04
02:07	02:07
03	03, 03:01P, 03:01, 03:02, 03:03, 03:07P
03:01	03:01
03:02	03:02
03:03	03:03
04	04, 04:01P, 04:01
04:01	04:01

Table 4-15: HLA DPB1 Unacceptable Antigen Equivalences

In addition to the alleles and p-groups displayed in this table, all non-null HLA-DPB1 alleles as of IMGT/HLA version 3.52.0 are available for reporting candidate, donor, or recipient HLA typing.

If this DPB1-Locus Unacceptable Antigen is reported:	All of the following HLA values are considered equivalent to the unacceptable antigen reported and to all the values within the row:
01:01	01:01P, 01:01, 162:01, 417:01, 462:01, 616:01, 733:01, 807:01, 810:01, 853:01, 931:01, 953:01, 979:01, 998:01, 999:01, 1024:01, 1038:01, 1050:01, 1068:01, 1076:01, 1151:01, 1162:01, 1183:01, 1287:01, 1314:01, 1361:01, 1392:01, 1406:01, 1443:01
02:01	02:01P, 02:01, 141:01, 352:01, 414:01, 416:01, 461:01, 617:01, 640:01, 678:01, 723:01, 783:01, 799:01, 819:01, 845:01, 857:01, 861:01, 955:01, 967:01, 975:01, 1036:01, 1051:01, 1055:01, 1077:01, 1082:01, 1094:01, 1102:01, 1115:01, 1160:01, 1175:01, 1198:01, 1227:01, 1243:01, 1248:01, 1266:01, 1290:01, 1298:01, 1307:01, 1312:01, 1315:01, 1320:01, 1323:01, 1326:01, 1344:01, 1352:01, 1360:01, 1363:01, 1369:01, 1372:01, 1405:01, 1417:01, 1419:01, 1456:01
02:02	02:02P, 02:02, 547:01,721:01, 766:01, 1188:01, 1376:01, 1437:01
03:01	03:01P, 03:01, 104:01, 124:01, 351:01, 669:01, 675:01, 676:01, 704:01, 706:01, 728:01, 829:01, 855:01, 938:01, 946:01, 948:01, 952:01, 1000:01, 1014:01, 1021:01, 1049:01, 1114:01, 1134:01, 1157:01, 1245:01, 1246:01, 1254:01, 1263:01, 1295:01, 1382:01, 1388:01, 1401:01, 1407:01, 1429:01
04:01	04:01P, 04:01, 126:01, 350:01, 415:01, 459:01, 464:01, 534:01, 615:01, 618:01, 670:01, 677:01, 699:01, 702:01, 755:01, 757:01, 765:01, 767:01, 784:01, 804:01, 806:01, 813:01, 820:01, 824:01, 826:01, 849:01, 850:01, 859:01, 880:01, 882:01, 926:01, 932:01, 939:01, 978:01, 988:01, 989:01, 992:01, 997:01, 1001:01, 1002:01, 1003:01, 1004:01, 1010:01, 1011:01, 1023:01, 1033:01, 1074:01, 1086:01, 1091:01, 1100:01, 1129:01, 1132:01, 1144:01, 1146:01, 1148:01, 1152:01, 1155:01, 1161:01, 1164:01, 1173:01, 1181:01, 1184:01, 1196:01, 1206:01, 1207:01, 1217:01, 1225:01, 1226:01, 1231:01, 1237:01, 1238:01, 1241:01, 1242:01, 1244:01, 1249:01, 1268:01, 1271:01, 1284:01, 1297:01, 1300:01, 1304:01, 1308:01, 1316:01, 1317:01, 1321:01, 1322:01, 1327:01, 1328:01, 1345:01, 1362:01, 1374:01, 1377:01, 1379:01, 1387:01, 1390:01, 1391:01, 1409:01, 1412:01, 1413:01, 1436:01, 1444:01, 1446:01, 1450:01, 1459:01, 1465:01, 1472:01, 1476:01

If this DPB1-Locus Unacceptable Antigen is reported:	All of the following HLA values are considered equivalent to the unacceptable antigen reported and to all the values within the row:
04:02	04:02P, 04:02, 105:01, 463:01, 571:01, 647:01, 665:01, 674:01, 701:01, 725:01, 726:01, 730:01, 731:01, 734:01, 735:01, 763:01, 809:01, 818:01, 823:01, 858:01, 881:01, 927:01, 933:01, 954:01, 958:01, 981:01, 1005:01, 1013:01, 1020:01, 1025:01, 1031:01, 1035:01, 1037:01, 1072:01, 1075:01, 1083:01, 1085:01, 1124:01, 1153:01, 1171:01, 1194:01, 1197:01, 1235:01, 1239:01, 1267:01, 1270:01, 1283:01, 1331:01, 1346:01, 1380:01, 1404:01, 1424:01, 1425:01, 1460:01
05:01	05:01P, 05:01, 135:01, 668:01, 729:01, 744:01, 764:01, 790:01, 847:01, 848:01, 851:01, 860:01, 923:01, 951:01, 1015:01, 1018:01, 1117:01, 1118:01, 1119:01, 1120:01, 1143:01, 1172:01, 1199:01, 1213:01, 1273:01, 1289:01, 1318:01, 1438:01, 1457:01, 1462:01, 1473:01
06:01	06:01P, 06:01,737:01, 906:01, 914:01, 1022:01, 1087:01, 1111:01, 1259:01, 1471:01
08:01	08:01
09:01	09:01P, 09:01, 797:01, 899:01, 1149:01, 1258:01, 1303:01, 1313:01, 1378:01
10:01	10:01P, 10:01, 650:01, 673:01, 902:01, 1126:01, 1261:01, 1470:01
11:01	11:01P, 11:01, 649:01, 654:01, 672:01, 707:01, 907:01, 937:01, 1063:01
13:01	13:01P, 13:01, 107:01, 133:01, 518:01, 519:01, 888:01, 924:01, 947:01, 996:01, 1065:01, 1069:01, 1105:01, 1123:01, 1131:01, 1185:01, 1232:01, 1294:01, 1451:01
14:01	14:01P, 14:01, 498:01, 572:01, 651:01, 671:01, 705:01, 834:01, 854:01, 949:01, 1187:01, 1348:01, 1354:01, 1384:01, 1395:01, 1414:01
15:01	15:01P, 15:01, 585:01, 896:01, 910:01, 1054:01, 1192:01, 1250:01, 1336:01, 1434:01
16:01	16:01P, 16:01, 652:01, 653:01, 864:01, 886:01, 940:01, 968:01, 1386:01
17:01	17:01P, 17:01, 131:01, 168:01, 460:01, 846:01, 956:01, 1032:01, 1052:01, 1233:01, 1265:01, 1367:01, 1394:01, 1397:01, 1431:01, 1435:01, 1475:01
18:01	18:01P, 18:01, 897:01, 942:01, 1165:01
19:01	19:01P, 19:01, 106:01, 533:01, 535:01, 785:01, 965:01, 1101:01, 1255:01, 1282:01
20:01	20:01P, 20:01, 905:01, 1389:01, 1426:01

If this DPB1-Locus Unacceptable Antigen is reported:	All of the following HLA values are considered equivalent to the unacceptable antigen reported and to all the values within the row:
21:01	21:01P, 21:01, 1019:01, 1186:01, 1190:01
22:01	22:01P, 22:01, 1026:01
23:01	23:01P, 23:01, 138:01
24:01	24:01
25:01	25:01P, 25:01, 1469:01
26:01	26:01P, 26:01, 1088:01
27:01	27:01
28:01	28:01P, 28:01, 296:01, 1286:01, 1324:01
29:01	29:01P, 29:01, 909:01
30:01	30:01
31:01	31:01P, 31:01, 945:01
34:01	34:01P, 34:01, 835:01, 913:01
35:01	35:01
38:01	38:01P, 38:01, 1099:01
39:01	39:01P, 39:01, 584:01
40:01	40:01P, 40:01, 745:01
45:01	45:01P, 45:01, 832:01
51:01	51:01P, 51:01, 736:01
55:01	55:01P, 55:01, 1353:01
57:01	57:01P, 57:01, 648:01
59:01	59:01P, 59:01,782:01
80:01	80:01P, 80:01, 762:01
81:01	81:01P, 81:01, 1383:01
85:01	85:01P, 85:01, 713:01, 901:01, 1034:01, 1441:01
90:01	90:01P, 90:01, 1012:01
100:01	100:01P, 100:01, 1483:01
104:01	104:01
105:01	105:01
106:01	106:01
107:01	107:01
124:01	124:01
126:01	126:01

If this DPB1-Locus Unacceptable Antigen is reported:	All of the following HLA values are considered equivalent to the unacceptable antigen reported and to all the values within the row:
130:01	130:01P, 130:01, 1211:01
131:01	131:01
132:01	132:01P, 132:01, 1027:01
135:01	135:01
137:01	137:01P, 137:01, 791:01
152:01	152:01P, 152:01, 944:01
184:01	184:01P, 184:01, 1224:01
233:01	233:01P, 233:01, 1428:01
398:01	398:01P, 398:01, 922:01
1096:01	1096P, 1096:01, 1133:01
1371:01	1371:01P, 1371:01, 1445:01

Table 4-16: Epitope based Unacceptable Antigen Assignment for DPB1

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
	01:01	04:01	11:01	13:01	15:01	23:01	26:01	27:01	31:01
	33:01	34:01	39:01	40:01	52:01	55:01	56:01	58:01	62:01
	63:01	65:01	66:01	67:01	71:01	72:01	74:01	85:01	87:01
	89:01	90:01	95:01	96:01	99:01	102:01	103:01	107:01	110:01
	112:01	117:01	118:01	121:01	125:01	126:01	127:01	128:01	133:01
	134:01	138:01	142:01	147:01	149:01	150:01	158:01	160:01	162:01
	169:01	173:01	174:01	175:01	176:01	177:01	178:01	179:01	180:01
	181:01	192:01	193:01	194:01	195:01	199:01	201:01	202:01	206:01
	207:01	209:01	212:01	213:01	220:01	224:01	225:01	227:01	228:01
	230:01	231:01	232:01	240:01	244:01	246:01	247:01	250:01	253:01
55AAE	255:01	262:01	264:01	267:01	268:01	272:01	275:01	276:01	278:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
55AAE	279:01	280:01	281:01	282:01	283:01	290:01	294:01	295:01	298:01
	299:01	303:01	304:01	305:01	306:01	314:01	318:01	319:01	320:01
	322:01	323:01	325:01	326:01	327:01	333:01	334:01	335:01	336:01
	340:01	341:01	345:01	346:01	348:01	350:01	353:01	354:01	356:01
	360:01	362:01	370:01	371:01	372:01	375:01	376:01	377:01	378:01
	387:01	388:01	389:01	392:01	393:01	396:01	397:01	398:01	399:01
	411:01	412:01	415:01	417:01	418:01	425:01	426:01	428:01	434:01
	435:01	436:01	437:01	438:01	440:01	449:01	451:01	453:01	454:01
	456:01	458:01	459:01	462:01	464:01	465:01	468:01	471:01	474:01
	475:01	476:01	479:01	480:01	481:01	482:01	483:01	485:01	486:01
	487:01	490:01	493:01	497:01	500:01	503:01	512:01	516:01	517:01
	518:01	519:01	520:01	521:01	522:01	523:01	524:01	529:01	531:01
	534:01	538:01	542:01	543:01	544:01	553:01	554:01	556:01	559:01
	561:01	562:01	563:01	564:01	565:01	569:01	575:01	576:01	578:01
	580:01	583:01	584:01	585:01	591:01	592:01	593:01	597:01	599:01
	600:01	607:01	609:01	612:01	614:01	615:01	616:01	618:01	623:01
	625:01	626:01	631:01	632:01	634:01	635:01	636:01	643:01	644:01
	649:01	654:01	658:01	666:01	667:01	670:01	672:01	677:01	679:01
	682:01	683:01	686:01	687:01	694:01	695:01	699:01	702:01	703:01
	707:01	708:01	709:01	713:01	716:01	722:01	733:01	739:01	742:01
	745:01	747:01	749:01	750:01	753:01	755:01	757:01	758:01	761:01
	765:01	767:01	768:01	769:01	772:01	773:01	784:01	787:01	788:01
	789:01	795:01	803:01	804:01	806:01	807:01	808:01	810:01	811:01
	812:01	813:01	814:01	820:01	822:01	824:01	826:01	828:01	830:01
	835:01	837:01	840:01	842:01	849:01	850:01	852:01	853:01	856:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
55AAE	859:01	879:01	880:01	882:01	888:01	893:01	895:01	896:01	901:01
	904:01	907:01	908:01	910:01	912:01	913:01	915:01	916:01	921:01
	922:01	924:01	926:01	930:01	931:01	932:01	934:01	937:01	945:01
	947:01	953:01	957:01	966:01	969:01	972:01	976:01	978:01	979:01
	988:01	989:01	991:01	992:01	993:01	996:01	997:01	998:01	999:01
	1001:01	1002:01	1003:01	1004:01	1010:01	1011:01	1012:01	1016:01	1023:01
	1024:01	1033:01	1034:01	1038:01	1040:01	1042:01	1046:01	1048:01	1050:01
	1054:01	1057:01	1060:01	1062:01	1063:01	1064:01	1065:01	1066:01	1068:01
	1069:01	1073:01	1074:01	1076:01	1078:01	1080:01	1081:01	1086:01	1088:01
	1091:01	1097:01	1100:01	1105:01	1108:01	1109:01	1113:01	1122:01	1123:01
	1129:01	1131:01	1132:01	1137:01	1138:01	1139:01	1141:01	1144:01	1145:01
	1146:01	1147:01	1148:01	1151:01	1152:01	1155:01	1161:01	1162:01	1164:01
	1166:01	1167:01	1170:01	1173:01	1177:01	1181:01	1183:01	1184:01	1185:01
	1192:01	1195:01	1196:01	1204:01	1205:01	1206:01	1207:01	1208:01	1212:01
	1214:01	1215:01	1216:01	1217:01	1218:01	1220:01	1221:01	1222:01	1225:01
	1226:01	1231:01	1232:01	1234:01	1237:01	1238:01	1241:01	1242:01	1244:01
	1249:01	1250:01	1252:01	1262:01	1264:01	1268:01	1271:01	1274:01	1277:01
	1284:01	1287:01	1292:01	1294:01	1297:01	1300:01	1301:01	1304:01	1306:01
	1308:01	1309:01	1310:01	1314:01	1316:01	1317:01	1321:01	1322:01	1327:01
	1328:01	1329:01	1333:01	1336:01	1337:01	1341:01	1342:01	1343:01	1345:01
	1353:01	1356:01	1358:01	1361:01	1362:01	1370:01	1374:01	1377:01	1379:01
	1385:01	1387:01	1390:01	1391:01	1392:01	1399:01	1406:01	1409:01	1412:01
55AAE	1413:01	1420:01	1421:01	1427:01	1433:01	1434:01	1436:01	1441:01	1443:01
	1444:01	1446:01	1447:01	1450:01	1451:01	1453:01	1454:01	1459:01	1464:01
	1465:01	1472:01	1476:01						

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
55DED	03:01	06:01	09:01	14:01	17:01	20:01	29:01	35:01	44:01
	46:01	50:01	57:01	69:01	70:01	76:01	78:01	80:01	86:01
	88:01	91:01	92:01	98:01	104:01	108:01	111:01	119:01	124:01
	130:01	131:01	132:01	152:01	156:01	157:01	164:01	166:01	168:01
	182:01	197:01	203:01	205:01	208:01	214:01	221:01	222:01	234:01
	235:01	241:01	242:01	243:01	245:01	248:01	249:01	251:01	259:01
	266:01	270:01	287:01	288:01	289:01	292:01	293:01	329:01	332:01
	343:01	351:01	355:01	361:01	363:01	379:01	383:01	384:01	385:01
	386:01	391:01	394:01	404:01	405:01	407:01	409:01	413:01	439:01
	442:01	445:01	446:01	447:01	460:01	472:01	484:01	491:01	492:01
	498:01	504:01	505:01	506:01	508:01	509:01	530:01	536:01	540:01
	541:01	545:01	546:01	548:01	555:01	566:01	567:01	568:01	572:01
	581:01	601:01	610:01	613:01	620:01	621:01	629:01	630:01	645:01
	648:01	651:01	662:01	664:01	669:01	671:01	675:01	676:01	684:01
	688:01	689:01	698:01	704:01	705:01	706:01	714:01	719:01	727:01
	728:01	737:01	760:01	762:01	797:01	801:01	815:01	829:01	833:01
	834:01	839:01	846:01	854:01	855:01	883:01	899:01	905:01	906:01
	909:01	914:01	920:01	935:01	938:01	944:01	946:01	948:01	949:01
	952:01	956:01	970:01	977:01	983:01	987:01	990:01	994:01	1000:01
	1009:01	1014:01	1017:01	1021:01	1022:01	1027:01	1030:01	1032:01	1043:01
	1047:01	1049:01	1052:01	1067:01	1071:01	1087:01	1090:01	1093:01	1103:01
	1104:01	1111:01	1114:01	1116:01	1125:01	1127:01	1128:01	1130:01	1134:01
	1149:01	1157:01	1158:01	1174:01	1178:01	1182:01	1187:01	1203:01	1211:01
	1233:01	1245:01	1246:01	1251:01	1254:01	1258:01	1259:01	1263:01	1265:01
	1278:01	1295:01	1303:01	1311:01	1313:01	1330:01	1339:01	1340:01	1348:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
55DED	1354:01	1355:01	1359:01	1365:01	1366:01	1367:01	1373:01	1378:01	1382:01
	1384:01	1388:01	1389:01	1394:01	1395:01	1396:01	1397:01	1401:01	1407:01
	1411:01	1414:01	1418:01	1422:01	1426:01	1429:01	1431:01	1432:01	1435:01
	1448:01	1452:01	1458:01	1466:01	1467:01	1471:01	1474:01	1475:01	1480:01
55DEE	02:01	04:02	08:01	10:01	16:01	18:01	25:01	28:01	37:01
	41:01	45:01	48:01	49:01	51:01	53:01	59:01	60:01	68:01
	73:01	75:01	77:01	79:01	81:01	82:01	83:01	93:01	94:01
	105:01	109:01	113:01	115:01	116:01	122:01	123:01	129:01	136:01
	137:01	141:01	143:01	144:01	145:01	146:01	151:01	153:01	155:01
	163:01	165:01	167:01	172:01	183:01	184:01	185:01	186:01	187:01
	188:01	189:01	191:01	196:01	198:01	200:01	204:01	210:01	211:01
	217:01	219:01	229:01	236:01	237:01	238:01	239:01	252:01	256:01
	257:01	258:01	260:01	261:01	263:01	265:01	269:01	271:01	273:01
	274:01	277:01	285:01	286:01	296:01	297:01	307:01	308:01	309:01
	310:01	311:01	312:01	313:01	316:01	321:01	324:01	338:01	339:01
	342:01	344:01	347:01	349:01	352:01	359:01	364:01	365:01	366:01
	367:01	368:01	369:01	373:01	374:01	380:01	381:01	402:01	410:01
	414:01	416:01	419:01	420:01	421:01	422:01	423:01	424:01	429:01
	430:01	431:01	432:01	433:01	441:01	443:01	444:01	448:01	452:01
	457:01	461:01	463:01	466:01	467:01	469:01	470:01	477:01	488:01
	489:01	494:01	499:01	501:01	502:01	510:01	511:01	513:01	514:01
	515:01	525:01	526:01	528:01	532:01	537:01	539:01	549:01	552:01
	557:01	571:01	574:01	577:01	579:01	582:01	586:01	594:01	595:01
	596:01	602:01	603:01	604:01	606:01	608:01	617:01	622:01	624:01
	627:01	628:01	633:01	637:01	639:01	640:01	641:01	646:01	647:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
55DEE	650:01	652:01	653:01	655:01	656:01	659:01	660:01	663:01	665:01
	673:01	674:01	678:01	680:01	681:01	685:01	690:01	692:01	701:01
	711:01	723:01	725:01	726:01	730:01	731:01	734:01	735:01	736:01
	740:01	741:01	751:01	752:01	759:01	763:01	770:01	771:01	774:01
	775:01	776:01	780:01	781:01	782:01	783:01	791:01	799:01	805:01
	809:01	816:01	817:01	818:01	819:01	823:01	827:01	832:01	836:01
	841:01	843:01	845:01	857:01	858:01	861:01	863:01	864:01	881:01
	884:01	885:01	886:01	887:01	889:01	890:01	891:01	892:01	897:01
	898:01	900:01	902:01	903:01	918:01	927:01	933:01	936:01	940:01
	942:01	943:01	954:01	955:01	958:01	963:01	964:01	967:01	968:01
	973:01	975:01	981:01	1005:01	1006:01	1007:01	1013:01	1020:01	1025:01
	1028:01	1031:01	1035:01	1036:01	1037:01	1039:01	1051:01	1053:01	1055:01
	1056:01	1059:01	1072:01	1075:01	1077:01	1082:01	1083:01	1085:01	1089:01
	1092:01	1094:01	1102:01	1106:01	1107:01	1110:01	1115:01	1124:01	1126:01
	1136:01	1140:01	1142:01	1150:01	1153:01	1159:01	1160:01	1163:01	1165:01
	1168:01	1171:01	1175:01	1176:01	1179:01	1194:01	1197:01	1198:01	1200:01
	1201:01	1210:01	1219:01	1224:01	1227:01	1230:01	1235:01	1236:01	1239:01
	1243:01	1247:01	1248:01	1253:01	1261:01	1266:01	1267:01	1270:01	1276:01
	1280:01	1281:01	1283:01	1286:01	1290:01	1296:01	1298:01	1307:01	1312:01
	1315:01	1319:01	1320:01	1323:01	1324:01	1326:01	1331:01	1335:01	1344:01
	1346:01	1347:01	1352:01	1360:01	1363:01	1368:01	1369:01	1371:01	1372:01
	1380:01	1381:01	1383:01	1386:01	1393:01	1402:01	1404:01	1405:01	1408:01
55DEE	1410:01	1417:01	1419:01	1424:01	1425:01	1445:01	1456:01	1460:01	1461:01
	1468:01	1469:01	1470:01	1479:01					
55EAE	02:02	05:01	19:01	21:01	22:01	24:01	30:01	36:01	38:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
55EAE	47:01	54:01	97:01	100:01	101:01	106:01	114:01	135:01	139:01
	140:01	170:01	171:01	223:01	226:01	233:01	284:01	291:01	300:01
	301:01	302:01	317:01	330:01	331:01	337:01	358:01	390:01	395:01
	400:01	406:01	408:01	473:01	478:01	495:01	496:01	527:01	533:01
	535:01	547:01	550:01	558:01	560:01	573:01	587:01	588:01	589:01
	590:01	611:01	619:01	638:01	668:01	697:01	715:01	717:01	718:01
	720:01	721:01	729:01	744:01	746:01	764:01	766:01	778:01	779:01
	785:01	790:01	798:01	802:01	847:01	848:01	851:01	860:01	923:01
	928:01	929:01	951:01	961:01	962:01	965:01	971:01	980:01	982:01
	1008:01	1015:01	1018:01	1019:01	1026:01	1061:01	1095:01	1099:01	1101:01
	1117:01	1118:01	1119:01	1120:01	1143:01	1156:01	1172:01	1180:01	1186:01
	1188:01	1189:01	1190:01	1199:01	1209:01	1213:01	1229:01	1240:01	1255:01
	1257:01	1272:01	1273:01	1282:01	1289:01	1293:01	1302:01	1318:01	1349:01
	1376:01	1400:01	1403:01	1428:01	1437:01	1438:01	1457:01	1462:01	1473:01
	1477:01	1481:01	1483:01						
84DEAV	01:01	03:01	05:01	06:01	08:01	09:01	10:01	11:01	13:01
	14:01	16:01	17:01	19:01	20:01	21:01	22:01	25:01	26:01
	27:01	29:01	30:01	31:01	35:01	36:01	37:01	38:01	44:01
	45:01	50:01	52:01	54:01	55:01	56:01	57:01	58:01	63:01
	65:01	67:01	68:01	69:01	70:01	76:01	78:01	79:01	84:01
	85:01	87:01	88:01	89:01	90:01	91:01	92:01	93:01	97:01
	98:01	102:01	103:01	104:01	106:01	107:01	110:01	111:01	114:01
	118:01	122:01	124:01	125:01	127:01	130:01	131:01	132:01	133:01
	135:01	136:01	137:01	140:01	142:01	147:01	150:01	152:01	156:01
	157:01	162:01	165:01	166:01	167:01	168:01	170:01	171:01	173:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
84DEAV	182:01	184:01	197:01	201:01	202:01	203:01	204:01	205:01	206:01
	207:01	208:01	209:01	220:01	221:01	222:01	223:01	226:01	234:01
	241:01	243:01	244:01	245:01	246:01	247:01	248:01	249:01	250:01
	251:01	259:01	264:01	265:01	266:01	267:01	268:01	269:01	270:01
	277:01	284:01	285:01	287:01	288:01	289:01	291:01	293:01	295:01
	300:01	301:01	304:01	305:01	312:01	313:01	314:01	315:01	316:01
	317:01	324:01	325:01	326:01	327:01	329:01	331:01	337:01	340:01
	343:01	346:01	348:01	349:01	351:01	353:01	358:01	361:01	362:01
	363:01	370:01	371:01	379:01	383:01	384:01	385:01	386:01	388:01
	389:01	390:01	391:01	393:01	394:01	395:01	398:01	400:01	404:01
	405:01	407:01	408:01	409:01	410:01	411:01	412:01	413:01	417:01
	422:01	437:01	438:01	439:01	442:01	445:01	446:01	447:01	448:01
	449:01	458:01	460:01	462:01	466:01	470:01	472:01	473:01	481:01
	483:01	490:01	491:01	492:01	495:01	498:01	503:01	504:01	505:01
	506:01	509:01	514:01	515:01	516:01	517:01	518:01	519:01	527:01
	530:01	532:01	533:01	535:01	536:01	538:01	541:01	542:01	543:01
	545:01	548:01	550:01	552:01	558:01	560:01	562:01	563:01	564:01
	565:01	566:01	567:01	568:01	572:01	573:01	587:01	588:01	597:01
	599:01	600:01	608:01	609:01	610:01	611:01	612:01	613:01	616:01
	619:01	621:01	623:01	629:01	630:01	631:01	632:01	633:01	634:01
	635:01	636:01	638:01	645:01	648:01	649:01	650:01	651:01	652:01
	653:01	654:01	662:01	664:01	667:01	668:01	669:01	671:01	672:01
	673:01	675:01	676:01	684:01	688:01	689:01	698:01	703:01	704:01
	705:01	706:01	707:01	708:01	709:01	710:01	711:01	713:01	714:01
	715:01	716:01	717:01	718:01	720:01	727:01	728:01	729:01	733:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
84DEAV	737:01	744:01	746:01	749:01	760:01	764:01	778:01	785:01	789:01
	790:01	791:01	797:01	798:01	801:01	802:01	807:01	810:01	815:01
	822:01	825:01	829:01	832:01	833:01	834:01	839:01	846:01	847:01
	848:01	851:01	853:01	854:01	855:01	856:01	860:01	864:01	879:01
	883:01	886:01	888:01	891:01	892:01	893:01	898:01	899:01	901:01
	902:01	904:01	905:01	906:01	907:01	908:01	909:01	912:01	914:01
	920:01	922:01	923:01	924:01	929:01	930:01	931:01	935:01	937:01
	938:01	940:01	944:01	945:01	946:01	947:01	948:01	949:01	951:01
	952:01	953:01	956:01	965:01	968:01	969:01	970:01	971:01	976:01
	977:01	979:01	980:01	982:01	983:01	990:01	991:01	994:01	996:01
	998:01	999:01	1000:01	1006:01	1007:01	1008:01	1009:01	1012:01	1014:01
	1015:01	1017:01	1018:01	1019:01	1021:01	1022:01	1024:01	1026:01	1027:01
	1030:01	1032:01	1034:01	1038:01	1043:01	1047:01	1049:01	1050:01	1052:01
	1057:01	1058:01	1061:01	1063:01	1065:01	1067:01	1068:01	1069:01	1071:01
	1073:01	1076:01	1087:01	1088:01	1090:01	1093:01	1095:01	1096:01	1099:01
	1101:01	1103:01	1105:01	1111:01	1114:01	1116:01	1117:01	1118:01	1119:01
	1120:01	1123:01	1125:01	1126:01	1127:01	1128:01	1130:01	1131:01	1133:01
	1134:01	1137:01	1140:01	1141:01	1143:01	1145:01	1147:01	1149:01	1150:01
	1151:01	1156:01	1157:01	1158:01	1162:01	1166:01	1168:01	1170:01	1172:01
	1178:01	1180:01	1182:01	1183:01	1185:01	1186:01	1187:01	1189:01	1190:01
	1199:01	1203:01	1204:01	1205:01	1211:01	1213:01	1224:01	1229:01	1232:01
	1233:01	1234:01	1240:01	1245:01	1246:01	1251:01	1254:01	1255:01	1257:01
	1258:01	1259:01	1261:01	1263:01	1264:01	1265:01	1272:01	1273:01	1278:01
84DEAV	1281:01	1282:01	1287:01	1289:01	1293:01	1294:01	1295:01	1302:01	1303:01
	1305:01	1306:01	1310:01	1311:01	1313:01	1314:01	1318:01	1329:01	1330:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
84DEAV	1333:01	1339:01	1340:01	1341:01	1342:01	1348:01	1349:01	1353:01	1354:01
	1355:01	1359:01	1361:01	1365:01	1366:01	1367:01	1370:01	1378:01	1382:01
	1384:01	1386:01	1388:01	1389:01	1392:01	1394:01	1395:01	1396:01	1397:01
	1400:01	1401:01	1406:01	1407:01	1411:01	1414:01	1418:01	1421:01	1426:01
	1429:01	1431:01	1432:01	1435:01	1438:01	1441:01	1443:01	1448:01	1451:01
	1452:01	1457:01	1458:01	1462:01	1464:01	1466:01	1467:01	1469:01	1470:01
	1471:01	1473:01	1475:01	1477:01	1480:01	1481:01			
84GGPM	02:01	02:02	04:01	04:02	23:01	24:01	32:01	33:01	39:01
	41:01	46:01	47:01	48:01	49:01	51:01	59:01	60:01	66:01
	71:01	72:01	73:01	75:01	77:01	80:01	81:01	82:01	83:01
	86:01	94:01	95:01	96:01	99:01	100:01	101:01	105:01	108:01
	109:01	112:01	113:01	115:01	116:01	117:01	121:01	123:01	126:01
	128:01	129:01	134:01	138:01	141:01	143:01	144:01	145:01	146:01
	148:01	149:01	151:01	153:01	155:01	158:01	163:01	164:01	169:01
	172:01	174:01	175:01	176:01	179:01	180:01	181:01	183:01	185:01
	186:01	187:01	188:01	189:01	190:01	191:01	192:01	193:01	194:01
	195:01	196:01	199:01	200:01	210:01	211:01	212:01	213:01	214:01
	215:01	217:01	219:01	224:01	225:01	227:01	228:01	229:01	231:01
	232:01	233:01	235:01	236:01	237:01	238:01	239:01	240:01	252:01
	253:01	254:01	255:01	256:01	257:01	258:01	260:01	261:01	262:01
	263:01	271:01	272:01	273:01	274:01	275:01	276:01	278:01	281:01
	282:01	283:01	286:01	294:01	297:01	298:01	302:01	303:01	306:01
	307:01	308:01	309:01	310:01	311:01	318:01	319:01	320:01	321:01
	322:01	323:01	332:01	334:01	335:01	336:01	338:01	339:01	341:01
	342:01	344:01	350:01	352:01	354:01	355:01	356:01	359:01	360:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
84GGPM	364:01	365:01	366:01	367:01	368:01	369:01	372:01	373:01	374:01
	375:01	376:01	377:01	378:01	380:01	381:01	392:01	396:01	397:01
	399:01	402:01	406:01	414:01	415:01	416:01	418:01	419:01	420:01
	421:01	423:01	424:01	425:01	426:01	427:01	428:01	429:01	430:01
	432:01	433:01	434:01	435:01	440:01	441:01	443:01	444:01	451:01
	452:01	453:01	456:01	457:01	459:01	461:01	463:01	464:01	465:01
	468:01	469:01	474:01	475:01	476:01	477:01	478:01	479:01	480:01
	485:01	486:01	487:01	488:01	494:01	496:01	497:01	500:01	501:01
	502:01	508:01	510:01	511:01	520:01	521:01	522:01	523:01	524:01
	525:01	528:01	529:01	531:01	534:01	537:01	539:01	540:01	547:01
	549:01	553:01	554:01	555:01	556:01	557:01	559:01	561:01	569:01
	571:01	574:01	575:01	576:01	577:01	578:01	579:01	581:01	582:01
	583:01	584:01	586:01	591:01	593:01	594:01	595:01	596:01	601:01
	602:01	603:01	604:01	605:01	606:01	607:01	614:01	615:01	617:01
	618:01	620:01	622:01	624:01	625:01	626:01	627:01	628:01	637:01
	639:01	640:01	641:01	642:01	643:01	646:01	647:01	655:01	656:01
	658:01	659:01	660:01	663:01	665:01	666:01	670:01	674:01	677:01
	678:01	679:01	680:01	681:01	682:01	683:01	685:01	686:01	687:01
	690:01	692:01	694:01	699:01	701:01	702:01	721:01	722:01	723:01
	725:01	726:01	730:01	731:01	734:01	735:01	736:01	739:01	741:01
	742:01	747:01	750:01	751:01	753:01	755:01	757:01	758:01	759:01
	761:01	762:01	763:01	765:01	766:01	767:01	769:01	770:01	771:01
	772:01	773:01	774:01	775:01	776:01	779:01	780:01	781:01	782:01
	783:01	784:01	787:01	788:01	795:01	796:01	799:01	803:01	804:01
	805:01	806:01	808:01	809:01	811:01	812:01	813:01	814:01	816:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
84GGPM	817:01	818:01	819:01	820:01	823:01	824:01	826:01	827:01	828:01
	830:01	836:01	837:01	840:01	841:01	842:01	843:01	845:01	849:01
	850:01	852:01	857:01	858:01	859:01	861:01	863:01	880:01	881:01
	882:01	884:01	885:01	887:01	889:01	890:01	895:01	915:01	916:01
	921:01	926:01	927:01	928:01	932:01	933:01	934:01	936:01	943:01
	954:01	955:01	957:01	958:01	961:01	962:01	963:01	964:01	966:01
	967:01	972:01	973:01	975:01	978:01	981:01	987:01	988:01	989:01
	992:01	993:01	997:01	1001:01	1002:01	1003:01	1004:01	1005:01	1010:01
	1011:01	1013:01	1016:01	1020:01	1023:01	1025:01	1028:01	1031:01	1033:01
	1035:01	1036:01	1037:01	1039:01	1040:01	1042:01	1046:01	1048:01	1051:01
	1053:01	1055:01	1056:01	1059:01	1060:01	1062:01	1064:01	1066:01	1072:01
	1074:01	1075:01	1077:01	1080:01	1081:01	1082:01	1083:01	1085:01	1086:01
	1089:01	1091:01	1094:01	1097:01	1100:01	1102:01	1104:01	1106:01	1108:01
	1110:01	1113:01	1115:01	1122:01	1124:01	1129:01	1132:01	1138:01	1139:01
	1144:01	1146:01	1148:01	1152:01	1153:01	1155:01	1159:01	1160:01	1161:01
	1163:01	1164:01	1167:01	1171:01	1173:01	1174:01	1175:01	1176:01	1177:01
	1179:01	1181:01	1184:01	1188:01	1194:01	1195:01	1196:01	1197:01	1198:01
	1200:01	1206:01	1207:01	1208:01	1209:01	1210:01	1212:01	1214:01	1215:01
	1216:01	1217:01	1218:01	1220:01	1221:01	1222:01	1223:01	1225:01	1226:01
	1227:01	1230:01	1231:01	1235:01	1237:01	1238:01	1239:01	1241:01	1242:01
	1243:01	1244:01	1247:01	1248:01	1249:01	1253:01	1262:01	1266:01	1267:01
	1268:01	1270:01	1271:01	1274:01	1276:01	1280:01	1283:01	1284:01	1290:01
	1292:01	1297:01	1298:01	1300:01	1301:01	1304:01	1307:01	1308:01	1309:01
	1312:01	1315:01	1316:01	1317:01	1320:01	1321:01	1322:01	1323:01	1326:01
	1327:01	1328:01	1331:01	1335:01	1337:01	1343:01	1344:01	1345:01	1346:01

If this Candidate Unacceptable Epitope is reported:	The following HLA values are considered equivalent to the reported unacceptable epitope:								
84GGPM	1347:01	1352:01	1356:01	1358:01	1360:01	1362:01	1363:01	1368:01	1369:01
	1371:01	1372:01	1374:01	1376:01	1377:01	1379:01	1380:01	1381:01	1383:01
	1385:01	1387:01	1390:01	1391:01	1393:01	1399:01	1402:01	1403:01	1404:01
	1405:01	1408:01	1409:01	1410:01	1412:01	1413:01	1417:01	1419:01	1420:01
	1424:01	1425:01	1428:01	1433:01	1436:01	1437:01	1444:01	1445:01	1446:01
	1447:01	1450:01	1453:01	1454:01	1456:01	1459:01	1460:01	1461:01	1465:01
	1468:01	1472:01	1474:01	1476:01	1479:01	1483:01			
84VGPM	15:01	18:01	28:01	34:01	40:01	53:01	62:01	74:01	139:01
	198:01	290:01	292:01	296:01	299:01	333:01	345:01	347:01	387:01
	471:01	482:01	484:01	493:01	499:01	512:01	526:01	580:01	585:01
	644:01	695:01	745:01	752:01	768:01	835:01	896:01	897:01	900:01
	903:01	910:01	913:01	918:01	942:01	1054:01	1109:01	1136:01	1142:01
	1165:01	1192:01	1201:01	1219:01	1250:01	1252:01	1286:01	1324:01	1336:01
	1422:01	1427:01	1434:01						

~~**4.10.C: HLA DPB1 Available Alleles**~~

~~**Table 4-17: Available OPTN DPB1 HLA Allele Values**~~

~~*Table 4-16* contains all HLA-DPB1 alleles available for reporting to the OPTN for candidate, donor, or recipient HLA typing.~~

~~01:01~~	~~02:01~~	~~02:02~~	~~03:01~~	~~04:01~~	~~04:02~~	~~05:01~~	~~06:01~~	~~08:01~~	~~09:01~~
~~10:01~~	~~11:01~~	~~13:01~~	~~14:01~~	~~15:01~~	~~16:01~~	~~17:01~~	~~18:01~~	~~19:01~~	~~20:01~~
~~21:01~~	~~22:01~~	~~23:01~~	~~24:01~~	~~25:01~~	~~26:01~~	~~27:01~~	~~28:01~~	~~29:01~~	~~30:01~~

31:01	32:01	33:01	34:01	35:01	36:01	37:01	38:01	39:01	40:01
41:01	44:01	45:01	46:01	47:01	48:01	49:01	50:01	51:01	52:01
53:01	54:01	55:01	56:01	57:01	58:01	59:01	60:01	62:01	63:01
65:01	66:01	67:01	68:01	69:01	70:01	71:01	72:01	73:01	74:01
75:01	76:01	77:01	78:01	79:01	80:01	81:01	82:01	83:01	84:01
85:01	86:01	87:01	88:01	89:01	90:01	91:01	92:01	93:01	94:01
95:01	96:01	97:01	98:01	99:01	100:01	101:01	102:01	103:01	104:01
105:01	106:01	107:01	108:01	109:01	110:01	111:01	112:01	113:01	114:01
115:01	116:01	117:01	118:01	119:01	121:01	122:01	123:01	124:01	125:01
126:01	127:01	128:01	129:01	130:01	131:01	132:01	133:01	134:01	135:01
136:01	137:01	138:01	139:01	140:01	141:01	142:01	143:01	144:01	145:01
146:01	147:01	148:01	149:01	150:01	151:01	152:01	153:01	155:01	156:01
157:01	158:01	160:01	162:01	163:01	164:01	165:01	166:01	167:01	168:01
169:01	170:01	171:01	172:01	173:01	174:01	175:01	176:01	177:01	178:01
179:01	180:01	181:01	182:01	183:01	184:01	185:01	186:01	187:01	188:01
189:01	190:01	191:01	192:01	193:01	194:01	195:01	196:01	197:01	198:01
199:01	200:01	201:01	202:01	203:01	204:01	205:01	206:01	207:01	208:01
209:01	210:01	211:01	212:01	213:01	214:01	215:01	217:01	219:01	220:01
221:01	222:01	223:01	224:01	225:01	226:01	227:01	228:01	229:01	230:01
231:01	232:01	233:01	234:01	235:01	236:01	237:01	238:01	239:01	240:01
241:01	242:01	243:01	244:01	245:01	246:01	247:01	248:01	249:01	250:01
251:01	252:01	253:01	254:01	255:01	256:01	257:01	258:01	259:01	260:01
261:01	262:01	263:01	264:01	265:01	266:01	267:01	268:01	269:01	270:01

271:01	272:01	273:01	274:01	275:01	276:01	277:01	278:01	279:01	280:01
281:01	282:01	283:01	284:01	285:01	286:01	287:01	288:01	289:01	290:01
291:01	292:01	293:01	294:01	295:01	296:01	297:01	298:01	299:01	300:01
301:01	302:01	303:01	304:01	305:01	306:01	307:01	308:01	309:01	310:01
311:01	312:01	313:01	314:01	315:01	316:01	317:01	318:01	319:01	320:01
321:01	322:01	323:01	324:01	325:01	326:01	327:01	329:01	330:01	331:01
332:01	333:01	334:01	335:01	336:01	337:01	338:01	339:01	340:01	341:01
342:01	343:01	344:01	345:01	346:01	347:01	348:01	349:01	350:01	351:01
352:01	353:01	354:01	355:01	356:01	358:01	359:01	360:01	361:01	362:01
363:01	364:01	365:01	366:01	367:01	368:01	369:01	370:01	371:01	372:01
373:01	374:01	375:01	376:01	377:01	378:01	379:01	380:01	381:01	383:01
384:01	385:01	386:01	387:01	388:01	389:01	390:01	391:01	392:01	393:01
394:01	395:01	396:01	397:01	398:01	399:01	400:01	402:01	404:01	405:01
406:01	407:01	408:01	409:01	410:01	411:01	412:01	413:01	414:01	415:01
416:01	417:01	418:01	419:01	420:01	421:01	422:01	423:01	424:01	425:01
426:01	427:01	428:01	429:01	430:01	431:01	432:01	433:01	434:01	435:01
436:01	437:01	438:01	439:01	440:01	441:01	442:01	443:01	444:01	445:01
446:01	447:01	448:01	449:01	451:01	452:01	453:01	454:01	456:01	457:01
458:01	459:01	460:01	461:01	462:01	463:01	464:01	465:01	466:01	467:01
468:01	469:01	470:01	471:01	472:01	473:01	474:01	475:01	476:01	477:01
478:01	479:01	480:01	481:01	482:01	483:01	484:01	485:01	486:01	487:01
488:01	489:01	490:01	491:01	492:01	493:01	494:01	495:01	496:01	497:01
498:01	499:01	500:01	501:01	502:01	503:01	504:01	505:01	506:01	508:01

509:01	510:01	511:01	512:01	513:01	514:01	515:01	516:01	517:01	518:01
519:01	520:01	521:01	522:01	523:01	524:01	525:01	526:01	527:01	528:01
529:01	530:01	531:01	532:01	533:01	534:01	535:01	536:01	537:01	538:01
539:01	540:01	541:01	542:01	543:01	544:01	545:01	546:01	547:01	548:01
549:01	550:01	552:01	553:01	554:01	555:01	556:01	557:01	558:01	559:01
560:01	561:01	562:01	563:01	564:01	565:01	566:01	567:01	568:01	569:01
571:01	572:01	573:01	574:01	575:01	576:01	577:01	578:01	579:01	580:01
581:01	582:01	583:01	584:01	585:01	586:01	587:01	588:01	589:01	590:01
591:01	592:01	593:01	594:01	595:01	596:01	597:01	599:01	600:01	601:01
602:01	603:01	604:01	605:01	606:01	607:01	608:01	609:01	610:01	611:01
612:01	613:01	614:01	615:01	616:01	617:01	618:01	619:01	620:01	621:01
622:01	623:01	624:01	625:01	626:01	627:01	628:01	629:01	630:01	631:01
632:01	633:01	634:01	635:01	636:01	637:01	638:01	639:01	640:01	641:01
642:01	643:01	644:01	645:01	646:01	647:01	648:01	649:01	650:01	651:01
652:01	653:01	654:01	655:01	656:01	658:01	659:01	660:01	662:01	663:01
664:01	665:01	666:01	667:01	668:01	669:01	670:01	671:01	672:01	673:01
674:01	675:01	676:01	677:01	678:01	679:01	680:01	681:01	682:01	683:01
684:01	685:01	686:01	687:01	688:01	689:01	690:01	692:01	694:01	695:01
697:01	698:01	699:01	701:01	702:01	703:01	704:01	705:01	706:01	707:01
708:01	709:01	710:01	711:01	713:01	714:01	715:01	716:01	717:01	718:01
718:01	719:01	720:01	721:01	722:01	723:01	725:01	726:01	727:01	729:01
730:01	731:01	733:01	734:01	735:01	736:01	737:01	739:01	740:01	741:01
742:01	744:01	745:01	746:01	747:01	749:01	750:01	751:01	752:01	753:01

755:01	757:01	758:01	759:01	760:01	761:01	762:01	763:01	764:01	765:01
766:01	767:01	768:01	769:01	770:01	771:01	772:01	773:01	774:01	775:01
776:01	778:01	779:01	780:01	781:01	782:01	783:01	784:01	785:01	787:01
788:01	789:01	790:01	791:01	795:01	796:01	797:01	798:01	799:01	801:01
802:01	803:01	804:01	805:01	806:01	807:01	808:01	809:01	810:01	811:01
812:01	813:01	814:01	815:01	816:01	817:01	818:01	819:01	820:01	822:01
823:01	824:01	825:01	826:01	827:01	828:01	829:01	830:01	832:01	833:01
834:01	835:01	836:01	837:01	839:01	840:01	841:01	842:01	843:01	845:01
846:01	847:01	848:01	849:01	850:01	851:01	852:01	853:01	854:01	855:01
856:01	857:01	858:01	859:01	860:01	861:01	863:01	864:01	879:01	880:01
881:01	882:01	883:01	884:01	885:01	886:01	887:01	888:01	889:01	890:01
891:01	892:01	893:01	895:01	896:01	897:01	898:01	899:01	900:01	901:01
902:01	903:01	904:01	905:01	906:01	907:01	908:01	909:01	910:01	912:01
913:01	914:01	915:01	916:01	918:01	920:01	921:01	922:01	923:01	924:01
926:01	927:01	928:01	929:01	930:01	931:01	932:01	933:01	934:01	935:01
936:01	937:01	938:01	939:01	940:01	942:01	943:01	944:01	945:01	946:01
947:01	948:01	949:01	951:01	952:01	953:01	954:01	955:01	956:01	957:01
958:01	961:01	962:01	963:01	964:01	965:01	966:01	967:01	968:01	969:01
970:01	971:01	972:01	973:01	975:01	976:01	977:01	978:01	979:01	980:01
981:01	982:01	983:01	987:01	988:01	989:01	990:01	991:01	992:01	993:01
994:01	996:01	997:01	998:01	999:01	1000:01	1001:01	1002:01	1003:01	1004:01
1005:01	1006:01	1007:01	1008:01	1009:01	1010:01	1011:01	1012:01	1013:01	1014:01
1015:01	1016:01	1017:01	1018:01	1019:01	1020:01	1021:01	1022:01	1023:01	1024:01

~~1025:01~~	~~1026:01~~	~~1027:01~~	~~1028:01~~	~~1030:01~~	~~1031:01~~	~~1032:01~~	~~1033:01~~	~~1034:01~~	~~1035:01~~
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47