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Nomenclature for Factors of the HLA System, 2026

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The WHO Nomenclature Committee for Factors of the HLA System has met several times since the publication of the last major report in 2010.[1] It met most recently in September 2023, to discuss additions to the serological defined HLA antigens. This report documents the additions and revisions to the nomenclature of HLA specificities following the principles established in previous reports.[1–19] Links to these reports and details of HLA Nomenclature can be found on the website: hla.alleles.org

1 | Naming of HLA genes and alleles

The HLA-OLI pseudogene has been reported and officially named HLA-R. A full list of all recognised HLA genes is given in Table 1.[20]

1.1 | Conditions for acceptance of new allele sequences

As emphasised in previous reports, there are required conditions for acceptance of new sequences for official names.

1. Where a sequence is obtained from cDNA, or where PCR products are subcloned prior to sequencing, several clones should have been sequenced.
2. Sanger sequencing should always be performed in both directions.
3. If direct sequencing of PCR amplified material is performed, products from at least two separate PCR reactions should have been sequenced.
4. When using next-generation or third generation sequencing, the unequivocal phasing of all polymorphisms should be confirmed across the complete sequence.
5. In individuals who are heterozygous for a locus, and where one of the alleles is novel, the novel allele must be sequenced in isolation from the second allele. Thus an allele sequence that is derived using a Sanger Sequencing-Based Typing (SBT) methodology, where both alleles of a heterozygous individual are sequenced together, is insufficient evidence for assignment of an official designation.
6. Sequence derived solely from the primers used to amplify an allele should not be included in the submitted sequence.
7. A novel sequence should be confirmed by repeat sequencing or employing a secondary DNA based typing technique to confirm the sequence.

TABLE 1 | Names for genes in the HLA region.

Name[a]	Previous equivalents	Molecular characteristics
HLA-A	—	Class I α-chain
HLA-B	—	Class I α-chain
HLA-C	—	Class I α-chain
HLA-E	E, '6.2'	Associated with class I 6.2-kB Hind III fragment
HLA-F	F, '5.4'	Associated with class I 5.4-kB Hind III fragment
HLA-G	G, '6.0'	Associated with class I 6.0-kB Hind III fragment
HLA-H	H, AR, '12.4', HLA-54	Class I pseudogene associated with 5.4-kB Hind III fragment
HLA-J	cda12, HLA-59	Class I pseudogene associated with 5.9-kB Hind III fragment
HLA-K	HLA-70	Class I pseudogene associated with 7.0-kB Hind III fragment
HLA-L	HLA-92	Class I pseudogene associated with 9.2-kB Hind III fragment
HLA-N	HLA-30	Class I gene fragment associated with 1.7 kb Hind III fragment
HLA-P	HLA-90	Class I gene fragment associated with 9.0-kB Hind III fragment
HLA-R	HLA-OLI	Class I pseudogene
HLA-S	HLA-17	Class I gene fragment associated with a 3.0 kb Hind III fragment
HLA-T	HLA-16	Class I gene fragment associated with 16.0-kB Hind III fragment
HLA-U	HLA-21	Class I gene fragment associated with 2.1-kB Hind III fragment
HLA-V	HLA-75	Class I gene fragment associated with 7.5-kB Hind III fragment
HLA-W	HLA-80	Class I gene fragment associated with 8.0-kB Hind III fragment
HLA-X	HLA-X	Class I gene fragment
HLA-Y	HLA-BEL/ COQ/DEL	Class I gene fragment
HLA-Z	HLA-Z1	Class I gene fragment located within the HLA Class II region

(Continues)

TABLE 1 | (Continued)

Name[a]	Previous equivalents	Molecular characteristics
HLA-DRA	DRα	DR α chain
HLA-DRB1	DRβI, DR1B	DR β1 chain determining specificities DR1, DR2, DR3, DR4, DR5 etc
HLA-DRB2	DRβII	Pseudogene with DR β-like sequences
HLA-DRB3	DRβIII, DR3B	DR β3 chain determining DR52 and Dw24, Dw25, Dw26 specificities
HLA-DRB4	DRβIV, DR4B	DR β4 chain determining DR53
HLA-DRB5	DRβIII	DR β5 chain determining DR51
HLA-DRB6	DRBX, DRBσ	DRB pseudogene found on DR1, DR2 and DR10 haplotypes
HLA-DRB7	DRBψ1	DRB pseudogene found on DR4, DR7 and DR9 haplotypes
HLA-DRB8	DRBψ2	DRB pseudogene found on DR4, DR7 and DR9 haplotypes
HLA-DRB9	M4.2 βexon	DRB pseudogene, isolated fragment
HLA-DQA1	DQα1, DQ1A	DQ α chain
HLA-DQB1	DQβ1, DQ1B	DQ β chain
HLA-DQA2	DXα, DQ2A	DQ α-chain-related sequence, not known to be expressed
HLA-DQB2	DXβ, DQ2B	DQ β-chain-related sequence, not known to be expressed
HLA-DQB3	DVβ, DQB3	DQ β-chain-related sequence, not known to be expressed
HLA-DOA	DNA, DZα, DOα	DO α chain
HLA-DOB	DOβ	DO β chain
HLA-DMA	RING6	DM α chain
HLA-DMB	RING7	DM β chain
HLA-DPA1	DPα1, DP1A	DP α chain
HLA-DPB1	DPβ1, DP1B	DP β chain
HLA-DPA2	DPα2, DP2A	DP α-chain-related pseudogene
HLA-DPA3	DPA3	DP α-chain-related pseudogene
HLA-DPB2	DPβ2, DP2B	DP β-chain-related pseudogene

(Continues)

TABLE 1 | (Continued)

Name[a]	Previous equivalents	Molecular characteristics
TAP1	ABCB2, RING4, Y3, PSF1	ABC (ATP Binding Cassette) transporter
TAP2	ABCB3, RING11, Y1, PSF2	ABC (ATP Binding Cassette) transporter
PSMB9	LMP2, RING12	Proteasome-related sequence
PSMB8	LMP7, RING10	Proteasome-related sequence
MICA	MICA, PERB11.1	Class I chain-related gene
MICB	MICB, PERB11.2	Class I chain-related gene
MICC	MICC, PERB11.3	Class I chain-related pseudogene
MICD	MICD, PERB11.4	Class I chain-related pseudogene
MICE	MICE, PERB11.5	Class I chain-related pseudogene
HFE	HFE1	Homeostatic iron regulator gene

[a]Gene names given in bold type have been assigned since the 2010 Nomenclature report.

8. An accession number in a databank should have been obtained. Sequences may be submitted to the databases online at the following addresses:
   ENA: www.ebi.ac.uk/submission/index.html
   GenBank: www.ncbi.nlm.nih.gov/WebSub/
   DDBJ: www.ddbj.nig.ac.jp/submission-navigation-e.html
9. Full-length sequences are preferable, though not essential; the current minimum requirements are complete exons 2 and 3 for an HLA class I sequence and complete exon 2 for an HLA class II sequence. It is anticipated that we will move to requiring full-length sequences in the near future and every effort should be made to submit full-length sequences, as sequencing technology has improved substantially and makes this very achievable.
10. Where a novel sequence differs only within an intron or other non-coding part of the gene, a full-length sequence must be obtained that covers all coding and non-coding regions. In the absence of a full-length genomic sequence from the most closely related allele, it may be required that this also be sequenced and submitted before a name can be assigned to the novel sequence.
11. Sequences should be submitted for naming prior to publication and details of the official names assigned included in the manuscripts published subsequently.
12. Sequences derived solely from tumour material will not be considered for assignment of official allele nomenclature.
13. Sequences derived from patients with malignant haematological disease should confirmed to be in the germline of the patient, using DNA derived from non-haematopoietic tissue, or in first degree relatives with the same allele.
14. The complete HLA phenotype for the *HLA-A*, *-B*, *-C* and *-DRB1* genes, with at least two-field resolution, should be submitted for the material in which a novel allele has been defined. In addition, the sample should have been characterised for the second allele at the locus of interest in a heterozygous individual, to the same level of resolution as that obtained for the novel allele.
15. DNA or other material, preferably cell lines, should, wherever possible, be made available in a publicly accessible repository or, alternatively, at least in the originating laboratory. Documentation on this will be maintained by the WHO Nomenclature Committee.
16. Submission of a sequence to the WHO Nomenclature Committee should be performed using the online submission tool available at www.ebi.ac.uk/ipd/imgt/hla/submission/. Researchers are expected to complete a questionnaire relating to the sequence and provide a comparison of their new sequence with known related alleles. If the sequence cannot be submitted using the online web tools, researchers should contact ipdsubs@anthonynolan.org directly for details of alternative submission methods.

Although at present it is only a recommendation that full-length sequences of the coding region of novel alleles be submitted, it was widely felt that in the future this should become a requirement for submission. Such requirement would remove many of the currently encountered ambiguities in the assignment of names to alleles for which partial sequences have been submitted and should not be burdensome as sequencing techniques have improved substantially since the submission conditions were first devised. In cases where novel mutations or polymorphisms are detected in non-coding regions of the gene, it will be a requirement that full-length sequences be submitted of both the novel allele and its most closely related allele.

It should be noted with some caution that cells from which only partial sequences have been obtained may later be shown to have different or novel alleles when further sequencing is performed. This is of particular importance in cases where partial sequences of what appears to be the same allele have been obtained from several different cells. In such cases, all cells studied have been listed in this report.

The list of those genes in the HLA region considered by the WHO Nomenclature Committee for Factors of the HLA System is given in Table 1.

1.2 | New Allele Sequences

Current practice is that official designations will be promptly assigned to newly described alleles in periods between Nomenclature Committee meetings, provided that the submitted data and its accompanying description meet the criteria outlined above. A list of the newly reported alleles is published every three months in nomenclature updates in the journals *HLA*, *Human Immunology* and the *International Journal of Immunogenetics*. The listing of references to new sequences does not imply priority of publication. The use of numbers or names for alleles, genes or specificities which pre-empt assignment of

official designations by the Nomenclature Committee is strongly discouraged.

A total of 43,758 HLA alleles have been named as of December 2025. A complete listing of the numbers of alleles assigned for each HLA genes is given in Table 2.

2 | HLA Antigen and Associated Antigen Designations

In September 2023, the WHO Nomenclature Committee for Factors of the HLA System met at the Stanford Blood Center located at Stanford University following the 18th International HLA and Immunogenetics Workshop held in Noordwijkerhout, the Netherlands in May 2022. The committee met to evaluate a proposal for the definition of additional and novel antigens defined *in silico*[21]. The *in silico* definition of HLA antigens was achieved by the systematic examination and cataloguing the amino acid (AA) replacements at specific residues determining epitopes (DEP) in all common HLA alleles at the classical HLA class I and class II loci [Common and Well Documented (CWD2.0) for alleles of *HLA-DRB3*, *-DRB4*, *-DRB5*, *-DQA1* and *-DPA1* and Common, Intermediate and Well Documented (CIWD3.0) for alleles of *HLA-A*, *-B*, *-C*, *-DRB1*, *-DQB1* and *-DPB1*].[21–23] The committee voted to accept the proposed serologic nomenclature update provided that a validation study was conducted.

The manuscript aiming to confirm these computationally predicted antigens defined by DEP residues for the 11 HLA loci was designed to assess and compare the antibody reactivity of patients' sera in solid phase assays with Single Antigen Bead (SAB) preparations from various HLA proteins[24]. The differences in correlation confirmed the distinctions between proposed associated antigens and identified a few additional antigens.[21, 25]

2.1 | HLA Antigen Designations

Following these studies a number of new HLA class I and class II serological specificities have now been named.

a. The HLA-C proteins that were previously listed as blanks have been designated; HLA-Cw12, -Cw14, -Cw15, -Cw16, -Cw17 and -Cw18.

b. The serologic specificities for antigens encoded by the HLA-DQA1 -DPA1 and -DPB1 genes were designated using DQA, DPA and DPB followed by the first-field allele name of the prototype common protein. For example, DQA01, DPA01 and DPB01, with the exception of DPB0201, DPB0202, DPB0401 and DPB0402, which are represented by their two-field designation. The HLA-DQ specificities named to date, HLA-DQ1 to -DQ9 are characterised by epitopes encoded on the HLA-DQB1 chain gene.

A full listing of all the serological specificities for HLA-A, -B, -C, -DR, -DQ, and -DP and cellular defined specificities for HLA-Dw and HLA-DPw are given in Table 3.

TABLE 2 | Number of HLA alleles for each HLA gene as of December 2025.

	Gene	Number of alleles
HLA class I genes	HLA-A	9,022
	HLA-B	10,876
	HLA-C	9,031
	HLA-E	388
	HLA-F	132
	HLA-G	197
	HLA-H	106
	HLA-J	34
	HLA-K	7
	HLA-L	6
	HLA-N	5
	HLA-P	5
	HLA-R	2
	HLA-S	7
	HLA-T	9
	HLA-U	7
	HLA-V	4
	HLA-W	13
	HLA-Y	3
HLA class II genes	HLA-DRA	129
	HLA-DRB1	3,924
	HLA-DRB2	1
	HLA-DRB3	661
	HLA-DRB4	341
	HLA-DRB5	255
	HLA-DRB6	4
	HLA-DRB7	2
	HLA-DRB8	1
	HLA-DRB9	6
	HLA-DQA1	994
	HLA-DQA2	42
	HLA-DQB1	3,022
	HLA-DQB2	41
	HLA-DPA1	897
	HLA-DPA2	6
	HLA-DPB1	3,075
	HLA-DPB2	7
	HLA-DMA	92
	HLA-DMB	142
	HLA-DOA	153
	HLA-DOB	109
Non-HLA genes	TAP1	19
	TAP2	106
	MICA	659
	MICB	328
	HFE	6

TABLE 3 | List of all recognised serological and cellular HLA specificities.

HLA-A	HLA-B	HLA-C	HLA-D[a]	HLA-DR	HLA-DQA	HLA-DQB	HLA-DP[a]	HLA-DPA	HLA-DPB
A1	B5	Cw1	Dw1	DR1	**DQA01**	DQ1	DPw1	**DPA01**	**DPB01**
A2	B7	Cw2	Dw2	DR2	**DQA02**	DQ2	DPw2	**DPA02**	**DPB0201**
A3	B8	Cw3	Dw3	DR3	**DQA03**	DQ3	DPw3		**DPB0202**
A9	B12	Cw4	Dw4	DR4	**DQA04**	DQ4	DPw4		**DPB03**
A10	B13	Cw5	Dw5	DR5	**DQA05**	DQ5(1)	DPw5		**DPB0401**
A11	B14	Cw6	Dw6	DR6	**DQA06**	DQ6(1)	DPw6		**DPB0402**
A19	B15	Cw7	Dw7	DR7		DQ7(3)			**DPB06**
A23(9)	B16	Cw8	Dw8	DR8		DQ8(3)			**DPB10**
A24(9)	B17	Cw9(w3)	Dw9	DR9		DQ9(3)			**DPB13**
A25(10)	B18	Cw10(w3)	Dw10	DR10					**DPB15**
A26(10)	B21	**Cw12**	Dw11(w7)	DR11(5)					**DPB17**
A28	B22	**Cw14**	Dw12	DR12(5)					**DPB18**
A29(19)	B27	**Cw15**	Dw13	DR13(6)					**DPB30**
A30(19)	B35	**Cw16**	Dw14	DR14(6)					**DPB31**
A31(19)	B37	**Cw17**	Dw15	DR15(2)					**DPB45**
A32(19)	B38(16)	**Cw18**	Dw16	DR16(2)					**DPB46**
A33(19)	B39(16)		Dw17(w7)	DR17(3)					**DPB80**
A34(10)	B40		Dw18(w6)	DR18(3)					
A36	B41		Dw19(w6)						
A43	B42		Dw20	DR51					
A66(10)	B44(12)		Dw21	DR52					
A68(28)	B45(12)		Dw22	DR53					
A69(28)	B46		Dw23						
A74(19)	B47		Dw24						
A80	B48		Dw25						
	B49(21)		Dw26						
	B50(21)								
	B51(5)								
	B52(5)								
	B53								
	B54(22)								
	B55(22)								
	B56(22)								
	B57(17)								
	B58(17)								
	B59								
	B60(40)								
	B61(40)								
	B62(15)								
	B63(15)								
	B64(14)								
	B65(14)								
	B67								
	B70								
	B71(70)								

(Continues)

TABLE 3 | (Continued)

HLA-A	HLA-B	HLA-C	HLA-D[a]	HLA-DR	HLA-DQA	HLA-DQB	HLA-DP[a]	HLA-DPA	HLA-DPB
	B72(70)								
	B73								
	B75(15)								
	B76(15)								
	B77(15)								
	B78								
	B81								
	B82								
	Bw4								
	Bw6								

Antigens given in bold type have been assigned since the 2010 Nomenclature report.
[a]Cellularly defined specificities.

2.2 | HLA Associated Antigen Designations

The concept of an HLA Associated Antigen was introduced in 1991, with the understanding that serological types would be more closely associated with the allele sequence defining them. Thirteen associated antigens were named at this time: A203, A210, A2403, B703, B3901, B3902, B4005, B5102, B5103, B7801, DR103, DR1403, and DR1404.[12] In 1996 the B2708 associated antigen was named and it was decided to shorten the B7801 antigen name to B78.[15] Following the definition of novel associated antigens documented below, it has been necessary to update the names of four of these: A203, A210, B703, and DR103, have been updated to A0203, A0210, B0703, and DR0103.

An expanded designation of novel Associated Antigens for the HLA-A, -B, -C, -DRB1, -DRB3, -DRB4 and -DRB5 genes are included in this nomenclature report. Associated Antigens were assigned systematically in a complementary manner to all common serologically distinguishable common antigen variants corresponding to a parent antigen or split.

a. The serologic specificities for HLA-A, -B, -C and -DRB1 were designated using the locus name followed by the corresponding two-field allele name excluding the colon (:) symbol of the most common or lowest-digit prototype allele, as was defined previously, for example A0201 corresponds to the A*02:01 allele.
b. Novel Associated Antigens for the HLA-DRB5 and -DRB3 genes were assigned with the DR51 and DR52 name respectively followed by the first field of the most common prototype protein (e.g., DR5101 for DRB5*01:01). Associated Antigen designations for less common proteins follow with a consecutive number designation (e.g., DR5103 for the protein DRB5*01:03).
c. No Associated Antigen Name was assigned to HLA antigens with only one DEP prototype (e.g., HLA-A1 and -DR53 do not have any Associated Antigen designation).
d. At this time no additional Associated Antigen designations were made for antigens corresponding to HLA-DQB1.
e. Associated Antigen designations were made only for proteins presenting identical amino acid replacements to those identified in the prototype protein at all DEP residues. For alleles lacking an Antigen or Associated Antigen serological designation, tables listing the officially recognised HLA antigens displaying the closest DEP correlation will be included in releases of the IPD-IMGT/HLA Database (www.ebi.ac.uk/ipd/imgt/hla).[26–28]

A full listing of all the Associated Antigens for HLA-A, -B, -C, —and -DR are given in Table 4.

3 | Serologic HLA-DQA1~DQB1 antigens defined by combinations of polymorphic subunits

This report includes nomenclature for the serological specificities encoded by both the HLA-DQA1 and HLA-DQB1 genes. As such it is now possible to define a nomenclature for the paired combination of both subunits of HLA-DQ molecules. Table 5 lists those proteins encoded in *cis* by common DQ haplotype blocks. The specificities resulting from *trans*-encoded heterodimers should be presented in the same format.

The newly assigned HLA antigens and associated antigens will be implemented in April 2026 and will be made available through the IPD-IMGT/HLA Database (www.ebi.ac.uk/ipd/imgt/hla) with the April 2026 release of the database.[26–28]

4 | The IPD-IMGT/HLA Database

The IPD-IMGT/HLA Database continues to act as the official repository for HLA sequences named by the WHO Nomenclature Committee for Factors of the HLA System.[26–28] The database contains sequences for all HLA alleles officially recognised by the WHO Nomenclature Committee for Factors of the HLA System and provides users with online tools and facilities for their retrieval and analysis. These include allele reports, alignment tools, and detailed descriptions of the source cells. The online IPD-IMGT/HLA Database submission tool allows both

TABLE 4 | List of all recognised HLA associated antigens.

HLA-A[a]	HLA-B[a]	HLA-C	HLA-DR[a]
A0201	B0702	Cw0304	DR0101
A0202	**B0703**	Cw0307	**DR0103**
A0203	B0710	Cw0308	DR0401
A0208	B0712	Cw0401	DR0402
A0210	B0713	Cw0403	DR0403
A0211	B0715	Cw0408	DR0412
A0216	B0736	Cw0410	DR0415
A0218	B0801	Cw0427	DR0801
A0219	B0802	Cw0501	DR0803
A0220	B1501	Cw0509	DR0808
A0244	B1502	Cw0602	DR0818
A0246	B1503	Cw0608	DR1101
A0256	B1510	Cw0627	DR1102
A0265	B1511	Cw0701	DR1103
A0285	B1516	Cw0702	DR1105
A0301	B1517	Cw0704	DR1107
A0305	B1520	Cw0707	DR1108
A0323	B1523	Cw0717	DR1117
A2301	B1524	Cw0801	DR1201
A2304	B1529	Cw0802	DR1202
A2402	B1537	Cw0803	DR1301
A2403	B1538	Cw0806	DR1303
A2404	B1540	Cw0810	DR1305
A2405	B1542	Cw1202	DR1317
A2408	B1547	Cw1204	DR1339
A2410	B1548	Cw1212	DR1343
A2414	B1552	Cw1502	DR1401
A2423	B1801	Cw1507	DR1402
A2424	B1805	Cw1601	**DR1403**
A2601	B1806	Cw1602	**DR1404**
A2603	B1809		DR1405
A2607	B2705		DR1410
A2614	B2708		DR1411
A2901	B2712		DR1414
A2902	B2714		DR1419
A3001	B3501		DR1422
A3002	B3502		DR1424
A3007	B3510		DR1448
A3101	B3512		DR1501
A3102	B3515		DR1504
A3201	B3516		DR1601
A3204	B3519		DR1602
A3301	B3520		
A3303	B3521		DR5101
A3308	B3528		DR5102
A3313	B3531		DR5103
A3401	B3701		DR5201
A3402	B3702		DR5202
A6601	B3704		DR5203
A6602	B3705		
A6801	B3801		
A6810	B3803		
A6813	B3806		
A6836	**B3901**		
	B3902		
	B3910		
	B4001		
	B4002		
	B4004		
	B4005		
	B4008		
	B4013		
	B4016		
	B4021		
	B4023		
	B4047		
	B4402		
	B4404		
	B4406		
	B4408		
	B4410		
	B4429		
	B4701		
	B4801		
	B4802		
	B4804		
	B4805		
	B5101		
	B5102		
	B5103		
	B5107		
	B5119		
	B5501		
	B5504		
	B5601		
	B5603		
	B6701		
	B6702		
	B7801		

[a]Previously named Associated Antigens are shown in bold type. Following the assignment of additional novel Associated Antigens documented in this report, the names of the A203, A210, B703 and DR103 have been extended to A0203, A0210, B0703, and DR0103.

TABLE 5 | HLA-DQA1~DQB1 *cis*-encoded heterodimer Antigens.

Serologic combinations of HLA-DQA~HLA-DQ heterodimer Antigens
DQA01~DQ5
DQA01~DQ6
DQA02~DQ2
DQA02~DQ9
DQA03~DQ2
DQA03~DQ4
DQA03~DQ7
DQA03~DQ8
DQA03~DQ9
DQA04~DQ4
DQA04~DQ7
DQA05~DQ2
DQA05~DQ7
DQA05~DQ9
DQA06~DQ7

new and confirmatory sequences to be submitted directly to the WHO Nomenclature Committee. New releases of the database are made every three months, in January, April, July and October, with the latest version (release 3.63.0 January 2026) containing 43,758 HLA alleles. The database may be accessed via the worldwide web at www.ebi.ac.uk/ipd/imgt/hla. The IPD-IMGT/HLA Database is currently supported by the following organisations: NMDP, TxMiller Foundation, CareDx, DKMS, Gift of Life, Werfen, Scisco Genetics, the European Federation for Immunogenetics (EFI), GenDx, Pirche, ThermoFisher, the American Society for Histocompatibility and Immunogenetics (ASHI), LabCorp, Histogenetics, the Asia-Pacific Histocompatibility and Immunogenetics Association (APHIA), BAG Diagnostics, Protrans, Inno-train, and Anthony Nolan.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Footnote

New sequences should be communicated to the WHO Nomenclature Committee for Factors of the HLA System via the sequence submission tool of the IPD-IMGT/HLA Database to receive official names, www.ebi.ac.uk/ipd/imgt/hla.

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