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Nomenclature

Nomenclature for factors of the HLA system, 1987*

This article presents the decisions of the nomenclature committee on leukocyte antigens, which met in New York on November 21–23, 1987

The HLA nomenclature committee met after the 10th International Histocompatibility Testing Workshop to consider revisions and additions to the nomenclature of specificities identified by serological and cellular typing, and the naming of genes based on molecular techniques following the principles established in previous reports (Bull WHO 39, 1968; Terasaki 1970; Bull WHO 47, 1972; Bull WHO 52, 1975; Bull WHO 56, 1978; Terasaki 1980; Albert et al. 1984). Only nomenclature for HLA "Class I" and "Class II" products was considered. Special attention was given to the naming of genes and alleles in the HLA-D region.

Molecular data have now identified many of the genes in the HLA region and their arrangement. It was, therefore, decided that a number of these genes, including especially those coding for the new products known to be expressed in the HLA-D region, could be given official designations following the general principles described in the previous report (Albert et al. 1984). All genes in the HLA-D region are:

i) prefixed by the letter D;
ii) followed by a letter P, etc., for the subregion (defined by the position and similarity of genes within a subregion);
iii) followed by letters A or B for alpha or beta chains (or related sequences in the case of pseudogenes) and, finally;
iv) a number when there is more than one alpha or beta chain gene (or pseudogene) in a subregion.

Thus, for example, the expressed alpha chain gene in the DQ region, which is coding for part of the DQ product, is called HLA-DQA1 while the DP beta pseudogene in the DP region is called HLA-DPB2 and the 3 or 4 DR β chain loci found in most haplotypes will be called HLA-DRB1, B2, B3, and B4 (Rollini et al. 1985, Gorski et al. 1987). Two new subregions have been called DO (as originally defined by a single beta chain gene, called DOβ) and DN (defined by a single alpha chain gene formerly known as DZα or DOα). New genes in the class I region will simply be given single letter designations in sequence, omitting D, and prefixed by HLA. Thus the gene defined by "clone 6.2" based on a 6.2 kilobase *Hind* III fragment detected by an HLA Class I probe (clone pHLA-6.2), is called HLA-E (Koller et al. 1987).

A complete listing of new gene names with their previous designations and molecular characterization is given in Table 1. The order of the named genes in the HLA-D region is given in Table 2 (Dunham et al. 1987, Carroll et al. 1987).

Nucleotide sequence data are revealing a wide variety of alleles with, in many cases, several alleles corresponding to a single serological or cellular specificity. Some HLA-D region specificities, moreover, such as DQw1, correspond to clearly associated pairs of DQ α and β chain variants. The ultimate definition of an allele must be the nucleotide sequence of a gene, possibly including controlling regions and introns. Since in practice it is mainly the expressed product which is relevant for biological function, it was decided that, to start with at least, an allele should be defined by the confirmed amino acid sequence of the protein product of a given gene. Each allele so defined will be given a unique number to be placed after an asterisk following the gene name, according to the convention adopted by the Human Gene Mapping Nomenclature Committee (Shows et al. 1979). Alleles with confirmed amino acid or nucleotide sequences will in general

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Table 1. New names for genes in the HLA region

Name	Previous equivalents	Molecular characteristics
HLA-E	E, "6.2"	Associated with class I 6.2-kb *Hind* III fragment (Koller et al. 1987)
HLA-DRA	DRα	DR α chain
HLA-DRB1	DRβ1, DR1B	DR β1 chain determining specificities DR1, DR3, DR4, DR5, etc.
HLA-DRB2	DRβII, DR2B	Pseudogene with DRβ-like sequences
HLA-DRB3	DRβIII, DR3B	DR β3 chain determining DRw52 and Dw24, Dw25, Dw26 specificities (Rollini et al. 1985)
HLA-DRB4	DRβIV, DR4B	DR β4 chain determining DRw53 (Gorski et al. 1987)
HLA-DQA1	DQα1, DQ1A	DQ α chain as expressed
HLA-DQB1	DQβ1, DQ1B	DQ β chain as expressed
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-DOB	DOβ	DO β chain
HLA-DNA	DZα, DOα	DN α chain
HLA-DPA1	DPα1, DP1A	DP α chain as expressed
HLA-DPB1	DPβ1, DP1B	DP β chain as expressed
HLA-DPA2	DPα2, DP2A	DP α chain-related pseudogene
HLA-DPB2	DPβ2, DP2B	DP β chain-related pseudogene

Table 2. Sequence of named genes in the HLA-D region

	DP	DN	DO	DQ	DR
(Centromere)	B2 A2 B1 A1	A	B	B2 A2 B1 A1	B1 B2 B3 or B4 A

be numbered using four digits, according to the following principles. The first two digits describe the most closely associated serologic specificity, and the other two complete the allele number. This makes it possible to retain as far as possible the relationship between alleles and serological specificities. Thus the formal designation of the allele corresponding to the B27 related specificity identified by one-dimensional isoelectric focusing, T cell clones, and a unique amino acid sequence is HLA-B*2701 (Table 3). However, following previous practice for the

Table 3. New designations of HLA-A and B alleles

New HLA alleles	HLA specificity	10W IEF* variants	Previous equivalents (ref.)	References for sequence data
A*0201	A2	A2.1	A2.2 (Brenner et al. 1985)	Mattson et al. 1987
A*0202	A2	A2.2	A2.1/A2.4 (Brenner et al. 1985)	Mattson et al. 1987, Ezquerra et al. 1986
A*0203	A2	A2.3	A2.3? (Brenner et al. 1985)	Mattson et al. 1987
A*0204	A2	A2.4	A2.3? (Brenner et al. 1985)	Mattson et al. 1987
B*0701	B7	B7.1		Taketani et al. 1984
B*0702	B7	B7.2		Biro et al. 1983
B*2701	B27	27.1	27f (Choo et al. 1986)	Rojo et al. 1987
B*2702	B27	27.2	27c (Choo et al. 1986), 27K (Breur-Vriesendorp et al. 1986), B27.2 (Toubert et al. 1984)	Seemann et al. 1986
B*2703	B27	27.3	27d (Choo et al. 1986), 27J (Breur-Vriesendorp et al. 1986)	Rojo et al. 1987, Choo et al. 1988
B*2704	B27	27.4	27b (Choo et al. 1986), 27C (Breur-Vriesendorp et al. 1986), B27.3 (Toubert et al. 1984)	Vega et al. 1985
B*2705	B27	27.5	27a (Choo et al. 1986), 27W (Breur-Vriesendorp et al. 1986), B27.1 (Toubert et al. 1984)	Seemann et al. 1986, Weiss et al. 1985
B*2706	B27	27.6	27D (Breur-Vriesendorp et al. 1986)	Vega et al. 1986

* One-dimensional isoelectric focusing electrophoresis performed at the 10th Workshop

naming of HLA gene symbols, the alternative designation *B2701* using italics for the combination of gene and allele symbols without an asterisk, is also acceptable for alleles of the HLA class I region genes. The asterisk will, however, be necessary in the designation of HLA-D region alleles, for example HLA-DRB4*0101, in order to separate clearly the number identifying a gene from that identifying an allele. It was decided that a systematic hierarchial nomenclature for the HLA-D region genes took precedence over the difficulty that might arise in naming alleles without the use of the asterisk. This, moreover, allowed the HLA nomenclature to parallel as closely as possible that being used for other human genes (Shows et al. 1979). Tables 3 and 4 give the new names for some HLA-A, B, and D region alleles.

It may become impossible in the future to retain the relationship between alleles and specificities as the complexity of this relation increases. If, in the future, alleles with different nucleotide sequences but the same amino acid sequence are to be defined, then those could be given related numbers using extra digits, for example *B27011*. Haplotypes are designated as described in previous reports, with the option of using specificity designations as a shorthand for complete allele names.

Consideration was given to the naming of specificities or products based on restriction fragment length polymorphism (RFLP) or biochemical techniques such as one- and two-dimensional isoelectric focusing electrophoresis. It was decided that, while RFLP "clusters" could be very helpful in defining phenotypes and genotypes with respect to both known or possibly new specificities and alleles, they did not yet contribute a basis for a formal designation. This may, in the future, come from, for example, extended restriction maps for one or more related haplotypes which correspond to well-defined RFLP clusters. In the meantime we recommend the adoption of the informal naming of clusters with the prefix 10W adopted by the 10th Workshop (Dupont 1988).

The biochemical techniques have been used, whenever possible, to support the designation of new specificities. These techniques clearly give definitions of products that may be more closely related to the amino acid sequence than either serological or cellular typing. The latter are, however, well established and serology in particular is still by far the most widely used technique for HLA typing. It was decided, therefore, that while it was justified to continue the naming of serological and cellular specificities as before, biochemically defined variants should not be given separate designations. Many amino acid sequences are, or will be soon, available for the definition of alleles, and these will subsume the presently known biochemical variants, making it unnecessary and perhaps confusing to introduce a new intermediate nomenclature.

Formal procedures are being established for the criteria for the acceptance of an amino acid sequence to be named as an allele and the assignment of an allele number.

The criteria for acceptance of a confirmed sequence include depositing in publicly accessible repositories or data bases:

a) the clone(s) from which the sequence was derived;
b) the cell source(s) from which the clone(s) was(were) derived;
c) the nucleotide sequence or, if not available, the amino acid sequence.

Provisional designations, indicated by a "w" before the allele number, may be given to partial sequences, for example, of the majority of an N-terminal domain of a DR beta chain.

The use of numbers or names for alleles, genes, or specificities which preempt formal designations such as DRB1*0102, DM, or HLA-F before consideration by the nomenclature committee is strongly discouraged.

Table 4. New designations of HLA-D region alleles

New HLA alleles	HLA-DR specificities	HLA-D Associated (T cell-defined) specificities	References
DRB1*0401	DR4	Dw4	Gregersen et al. 1986a
DRB1*0402	DR4	Dw10	Gregersen et al. 1986a
DRB1*0403	DR4	Dw13	Cairns et al. 1985
DRB1*0404	DR4	Dw14	Gregersen et al. 1986a, Cairns et al. 1985
DRB1*0405	DR4	Dw15	Gregersen et al. 1986a
DRB3*0101	DRw52a	Dw24	Rollini et al. 1985
DRB3*0201	DRw52b	Dw25	Rollini et al. 1985
DRB3*0301	DRw52c	Dw26	Rollini et al. 1985
DRB4*0101	DRw53	Dw4, Dw10, Dw13, Dw14, Dw15, Dw17, Dw23	Gregersen et al. 1986b, Young et al. 1987

HLA-A, B, and C specificities

As before, the HLA-A and B specificities are numbered jointly with nonoverlapping numbers. New provisional designations for HLA-A, B, and C specificities are listed in Table 5. The only new HLA-A specificity is Aw74, formerly known as Th, a split of Aw19 found mainly in black populations and clearly defined by sera in the Aw19 antigen society.

Three new HLA-B locus specificities were identified: HLA-Bw75, Bw76, and Bw77. These are splits of B15. Bw75, formerly Bw62.1, SH7, or TS1, is a short version of Bw62 in both caucasoids and orientals showing cross-reactivity with B35 sera. Bw76, formerly 15S, is mainly found in the Thai population characterized by cross-reactivity with B45 sera. Both Bw75 and Bw76 are Bw6 associated. HLA-Bw77, formerly B15T, is a Bw4-associated split of B15 and is distinguished from Bw63 by reactivity to Bw53-defining sera. Bw77 is found in both Thai and other southeast Asian populations.

Three new HLA-C locus specificities were identified: HLA-Cw9, Cw10, and Cw11. HLA-Cw9 and Cw10 are splits of Cw3. HLA-Cw9, formerly known as Cw3.1, is in linkage disequilibrium with Bw55, and Cw10, formerly known as Cw3.2, is in linkage disequilibrium with Bw60.

Table 5. New provisional designations of HLA-A, B, and C specificities

New	Previous equivalents	Associated with
Aw74	Th	-
Bw75	Bw62.1 (15), SH7, ST1	Bw6
Bw76	15S, 15.4	Bw6
Bw77	15T, 15.2	Bw4
Cw9	Cw3.1	Bw55
Cw10	Cw3.2	Bw60
Cw11	Cx46, Cw1+3, Cw1x3, C-Bangkok, CSH1	Bw46

Bw62 is found in association with both Cw9 and Cw10. HLA-Cw11 is the antigen associated with Bw46, formerly known as Cx46 Thai, Cw1x3, Cw1+3, or C Bangkok. Sequence data has shown that this antigen combines parts of the Cw1 and Cw3 sequences to form a new specificity. Parts of this sequence are also found in the associated Bw46 sequence (Parham et al. 1988).

HLA-D region specificities

No new provisional designations were assigned to the HLA-DP locus, as few antibodies were available for this identification and no PLT testing was carried out at the Workshop. New provisional designations were assigned to four HLA-DR specificities, six HLA-DQ specificities (Table 6), and seven HLA-Dw specificities (Table 7).

HLA-DR specificities

Of the HLA-DR specificities, one antigen, HLA-DRw9, was upgraded to HLA-DR9, dropping the "w" designation according to previous criteria. The new provisional HLA-DR specificities are HLA-DRw15, DRw16, DRw17, and DRw18. HLA-DRw15 and DRw16 are splits of HLA-DR2. HLA-DRw15, formerly known as DR2 long or DR2.1, is associated with the newly designated DQ antigen DQw6 (DQ1.2). DRw16, formerly known as DR2 short, is associated with DQw5 (DQ1.1). It is distinguished from DRw15 by lack of reactivity to long DR2 sera. HLA-DRw17 and DRw18 are splits of DR3. DRw17 includes most of the originally defined DR3 specificity usually associated with DQw2. DRw18 is a short DR3 specificity found in black populations and associated with Bw42 and DQw4 ("Wa"). This specificity is also defined by T cell clones but is not assigned a Dw specificity since serological reagents exist.

Table 6. New provisional HLA-DR and DQ specificities

New*	Previous designations	Associated with	Biochemical variant
DRw15	DR2 long		
DRw16	DR2 short, FT31		
DRw17	DR3 long		
DRw18	DR3 short	Bw42	
DQw4	DQ "Wa"	DRw8, Dw15	DQβ "Wa"
DQw5	DQ "1.1"	DR1, DRw10, DRw14, DRw16	DQβ "1.1"
DQw6	DQ "1.2"	DRw15, DRw13	DQβ "1.2", "1.12", "1.18"
DQw7	DQ "3.1", TA10+, IIB3−	DRw11, DRw12, DR4	DQβ "3.1"
DQw8	DQ "3.2", TA10−, IIB3+	DR4	DQβ "3.2"
DQw9	DQ "3.3", TA10−, IIB3+	DR7, DR9	DQβ "3.3"

* T cell clones identify: DQw5(DR1) and DQw6(DRw13, DRw15); subsets of DRw13(Dw18), DRw13(Dw19), and DRw14(Dw9); and the DQw3 variants DQw7(DR4,"3.1") and DQw8(DR4,"3.2")

Table 7. New provisional HLA-D (T cell-defined) specificities

New	Previous designations	Associated with
Dw20	LD14, LVA	DR1, DQw5, B14
Dw21	LD2s, MN2, FJO, AZH	DRw16, DQw5
Dw22	DB9, LD5a	DRw16, DQw7
Dw23	DB5	DR9, DQw9
Dw24	52a, LB-Q4, βIII-3	B8,DR3; DRw13,Dw18; DRw14, Dw16
Dw25	52b, LB-Q1, βIII-1, BO-1	B18,DR3; DRw11,Dw5; DRw12,DB6; DRw13,Dw18; DRw14,Dw9
Dw26	52c, βIII-2	DRw13,Dw19

HLA-DQ specificities

Six new provisional DQ designations were assigned. It was noticeable that most of these specificities were identifiable by monoclonal antibodies which made the definition of antigens very clear. DQw4, formerly Wa, appears to be allelic to DQw1, 2, and 3 and in positive linkage disequilibrium with DRw8, DR4(Dw15), and DRw18. It is identified clearly both by specific monoclonal antibodies and antibodies also reacting with DQw1 and/or DQw8. The DQw4 β chain shows a characteristic electrophoretic pattern. DQw5 and DQw6 are splits of DQw1 identified by monoclonal antibodies and antisera and characterized in part by different electrophoretic DQβ chain patterns. DQw5, formerly DQ"1.1", is associated with DR1, DRw16 (DR2 short), DRw10, and DRw14. A characteristic electrophoretic pattern of the DQβ chain is seen in DR1,DQw5 cells. DQw6, formerly DQ"1.2", the other split of DQw1, is in positive linkage disequilibrium with DRw15 (DR2 long) and DRw13. A characteristic electrophoretic pattern is seen for the DQβ chain associated with the three haplotypes DRw15,Dw2; DRw15,Dw12; and DRw13, Dw18.

Three splits of DQw3 have been identified: DQw7, DQw8, and DQw9. DQw7, formerly TA10, "3.1", is identified by specific monoclonal antibodies being TA10 positive and negative with the monoclonal antibody IIB3. It is associated with DRw11, DRw12, and a subset of DR4. DQw7 shows a characteristic DQβ pattern "3.1" in 2D gel electrophoresis. DQw8, formerly "3.2", is another split of DQw3, being TA10 negative and positive to IIB3. It is in linkage disequilibrium with DR4. The DQβ chain has a characteristic 2D electrophoretic pattern "3.2". DQw9 is the third split of DQw3, characterized also as being positive to IIB3 and negative to TA10. DQw9 is in linkage disequilibrium with DR9 and those DR7 (Dw11) which are not DQw2 associated. DQw9 has a characteristic electrophoretic DQβ pattern, "3.3".

HLA-D (T cell-defined) specificities

Cellular typing reagents are capable of identifying HLA class II specificities which may not be detectable using alloantisera or for which appropriate serologic reagents have not yet identified. HLA-Dw specificities have traditionally been defined with HLA-D homozygous typing cells (HTCs) in primary *in vitro* mixed lymphocyte cultures (MLCs). HLA-DP and other class II specificities (for example LB-Q1 and LB-Q4) have been defined using secondary MLCs. In recent years, it has become clear that cloned populations of T-lymphocytes can be generated which recognize allospecificities similar or identical to those detected by primary or secondary MLC typing. Furthermore, T cell clones may be identified whose pattern of reactivity corresponds to the presence of a unique amino acid sequence in the class II molecule. It was therefore decided to extend the definition of HLA-Dw specificities to include T-cell defined determinants using either bulk culture or clonal cellular reagents including either cytotoxic (CTLc) or proliferative (PTLc) T cell clones. New HLA-Dw specificities were defined when more than one independently derived T-cell reagent identified the particular HLA class II specificity. New HLA-Dw specificities were assigned when equivalent serologic reagents were not available (e. g., Dw24, Dw25, Dw26). Conversely, new HLA-Dw specificities were not assigned when equivalent serologic reagents were identified (e. g., DRw18). Monoclonal antibody blocking of T-lymphocyte clones was used to discriminate between HLA-DP speci-

Table 8. HLA-D (T cell-defined) and DR relationships

HLA-D specificities	Associated DR specificities
Dw1, Dw20	DR1
Dw2, Dw12	DRw15 (2)
Dw21, Dw22	DRw16 (2)
Dw3	DR3
Dw4, Dw10, Dw13, Dw14, Dw15	DR4
Dw5	DRw11 (5)
Dw6, Dw18, Dw19	DRw13 (w6)
Dw9, Dw16	DRw14 (w6)
Dw7, Dw11, Dw17	DR7
Dw8	DRw8
Dw23	DR9
Dw24, Dw25, Dw26	DRw52

Table 9. Complete listing of recognized HLA specificities

A	B	C	D	DR	DQ	DP
A1	B5	Cw1	Dw1	DR1	DQw1	DPw1
A2	B7	Cw2	Dw2	DR2	DQw2	DPw2
A3	B8	Cw3	Dw3	DR3	DQw3	DPw3
A9	B12	Cw4	Dw4	DR4	DQw4	DPw4
A10	B13	Cw5	Dw5	DR5	DQw5 (w1)	DPw5
A11	B14	Cw6	Dw6	DRw6	DQw6 (w1)	DPw6
Aw19	B15	Cw7	Dw7	DR7	DQw7 (w3)	
A23 (9)	B16	Cw8	Dw8	DRw8	DQw8 (w3)	
A24 (9)	B17	Cw9 (w3)	Dw9	DR9	DQw9 (w3)	
A25 (10)	B18	Cw10 (w3)	Dw10	DRw10		
A26 (10)	B21	Cw11	Dw11 (w7)	DRw11 (5)		
A28	Bw22		Dw12	DRw12 (5)		
A29 (w19)	B27		Dw13	DRw13 (w6)		
A30 (w19)	B35		Dw14	DRw14 (w6)		
A31 (w19)	B37		Dw15	DRw15 (2)		
A32 (w19)	B38 (16)		Dw16	DRw16 (2)		
Aw33 (w19)	B39 (16)		Dw17 (w7)	DRw17 (3)		
Aw34 (10)	B40		Dw18 (w6)	DRw18 (3)		
Aw36	Bw41		Dw19 (w6)			
Aw43	Bw42		Dw20	DRw52		
Aw66 (10)	B44 (12)		Dw21			
Aw68 (28)	B45 (12)		Dw22	DRw53		
Aw69 (28)	Bw46		Dw23			
Aw74 (w19)	Bw47		Dw24			
	Bw48		Dw25			
	B49 (21)		Dw26			
	Bw50 (21)					
	B51 (5)					
	Bw52 (5)					
	Bw53					
	Bw54 (w22)					
	Bw55 (w22)					
	Bw56 (w22)					
	Bw57 (17)					
	Bw58 (17)					
	Bw59					
	Bw60 (40)					
	Bw61 (40)					
	Bw62 (15)					
	Bw63 (15)					
	Bw64 (14)					
	Bw65 (14)					
	Bw67					
	Bw70					
	Bw71 (w70)					
	Bw72 (w70)					
	Bw73					
	Bw75 (15)					
	Bw76 (15)					
	Bw77 (15)					
	Bw4					
	Bw6					

The listings of broad specificities in parenthesis after a narrow specificity, e. g., HLA-A23 (9) is optional. The following is a listing of these specificities which arose as clear-cut splits of other specificities.

Original broad specificities	Splits
A9	A23, A24
A10	A25, A26, Aw34, Aw66
Aw19	A29, A30, A31, A32, Aw33, Aw74
A28	Aw68. Aw69
B5	B51, Bw52
B12	B44, B45
B14	Bw64, Bw65
B15	Bw62, Bw63, Bw75, Bw76, Bw77
B16	B38, B39
B17	Bw57, Bw58
B21	B49, Bw50
B21	B49, Bw50
Bw22	Bw54, Bw55, Bw56
B40	Bw60, Bw61
Bw70	Bw71, Bw72
Cw3	Cw9, Cw10
DR2	DRw15, DRw16
DR3	DRw17, DRw18
DR5	DRw11, DRw12
DRw6	DRw13, DRw14
DQw1	DQw5, DQw6
DQw3	DQw7, DQw8, DQw9
Dw6	Dw18, Dw19
Dw7	Dw11, Dw17

The following specificities are generally agreed inclusions of HLA-B specificities

Bw4 and Bw6.

Bw4: B5, B13, B17, B27, B37, B38 (16), B44 (12), Bw47, B49 (21), B51 (5). Bw52 (5), Bw53, Bw57 (17), Bw58 (17), Bw59, Bw63 (15), Bw77 (15).

Bw6: B7, B8, B14, B18, Bw22, B35, B39 (16), B40, Bw41, Bw42, B45 (12). Bw46, Bw48, Bw50 (21), Bw54 (w22), Bw55 (w22), Bw56 (w22) Bw60 (40), Bw61 (40), Bw62 (15), Bw64 (14), Bw65 (14), Bw67, Bw70. Bw71 (w70), Bw72 (w70), Bw73, Bw75 (15), Bw76 (15).

The following specificities are generally agreed to be associated with DRw52 and DRw53:

DRw52: DR3, DR5, DRw6, DRw8, DRw11 (15), DRw12 (5), DRw13 (w6). DRw14 (w6), DRw17 (3), DRw18 (3).

DRw53: DR4, DR7, DR9

ficities and the other class II T-cell defined determinants (Dw).

New provisional designations for HLA-Dw specificities are listed in Table 7. Dw20 (LD14), Dw21 (previously LD2sh, "AZH", "FJ0", "MN2"), Dw22 (previously DB9 or LD5a; found in Amerindians), and Dw23 (previously DB5; found in Caucasoids, but more commonly in Orientals) are T cell-defined specificities associated with the DRB1 gene. Dw20 is associated with the B14,DR1 haplotype. Dw21 and Dw22 are associated with DRw16 (DR2 short), and Dw23 is associated with DR9.

New provisional designations for HLA-Dw specificities were given to the alleles of the DRB3 (DRw52) gene. HLA-Dw24 (previously 52a, LB-Q4, βIII-3), Dw25 (previously 52b, LB-Q1, βIII-1, BO-1), and Dw26 (previously 52c, βIII-2) were clearly identified by two or more PTLc or CTLc. Dw24 is associated with the haplotypes B8,DR3,Dw3; DRw13,Dw18; and DRw14,Dw16. Dw25 is associated with B18,DR3, Dw3; DRw11,Dw5; DRw12,DB6; DRw13,Dw18; and DRw14,Dw9. Dw26 is associated with DRw13,Dw19. The DRw13,Dw18 haplotype was thus subdivided according to the DRw52 variants: DRw13,DW18,Dw24 and DRw13,Dw18, Dw25.

The relationship between T-cell defined Dw specificities and DR alleles is depicted in Table 8.

A complete listing of the recognized HLA specificities is given in Table 9. Further background to the basis for the decisions reported here can be found in *Histocompatibility Testing 1987* (Dupont 1988).

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