International Society of Blood Transfusion

Vox Sang. 49: 171–175 (1985)

0042–9007/85/0492–0171 $2.75/0

ISBT Working Party on Terminology for Red Cell Surface Antigens: Munich Report

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The ISBT Working Party on Terminology for Red Cell Surface Antigens was established in 1980 under the chairmanship of Dr. F.H. Allen, Jr., to devise a numerical nomenclature suitable for computerization. The intent is to provide a standard terminology for those who care to use it, not to replace existing alphabetical symbols. The Working Party is also charged with maintaining uniformity in alphabetical designations.

The initial meeting of the Working Party was held in Montreal on August 16th, 1980, and a second meeting convened in New York on October 29th, 1981; the decisions to give high priority to assignment of numbers for each of the blood group specificities, to the avoidance of superscripts and subscripts in designations of new specificities, and to the use of capital letters of the Latin alphabet, were unanimous [1]. Subcommittees were formed to deal with the various blood group systems and unassigned low and high incidence antigens separately. This report is a compilation of the recommendations made by the subcommittees and accepted by the Working Party at the Budapest meeting on August 1st, 1982 [2] and at the Munich meeting on July 21st, 1984.

Numerical Designations

For computer purposes, it is immaterial whether there is any rhyme or reason to the numerical designations of specificities so long as any particular number is committed to a unique specificity. However, to facilitate the use of numerical terminology for other purposes and to make it easier to remember, we have attempted to keep some semblance of order. A 6-digit numerical system has been devised, whereby the first 3 numbers represent the blood group system and the last 3 represent the specificity, e.g. 001001 indicates the A antigen of the ABO system.

Blood Group Systems

The numerical and alphabetical designations for blood group systems and their component specificities are set out in tables I and II. As will be seen, a blood group system may include specificities determined in the same

Table I. Designations for blood group system specificities

Name	Symbol	Number	Number within system								
			001	002	003	004	005	006	007	008	009
ABO	AB	001	A	B	A,B	A1	H				
MN	MNS	002	M	N	S	s	U	He	Mi	M^c	Vw
P	PI	003	PI	*P	P^k						
Rh	RH	004	D	C	E	c	e	f	Ce	C^w	C^x
Lutheran	LU	005	Lu^a	Lu^b	Lu^{ab}	Barnes	Beal	Jan-kow-ski	Gary	Tay-lor	Mull
Kell	KEL	006	K	k	Kp^a	Kp^b	Ku	Js^a	Js^b	Kw	*KL
Lewis	LE	007	Le^a	Le^b							
Duffy	FY	008	Fy^a	Fy^b	Fy^3	Fy^4	Fy^5				
Kidd	JK	009	Jk^a	Jk^b	Jk^{ab}						
Diego	DI	010	Di^a	Di^b							
Yt	YT	011	Yt^a	Yt^b							
Xg	XG	012	Xg^a								
Scianna	SC	013	Sm	Bu^a	Sc^3						
Dombrock	DO	014	Do^a	Do^b							
Colton	CO	015	Co^a	Co^b	Co^{ab}						
Landsteiner-Wiener	LW	016	*LW1	*LW2	*LW3	*LW4	LW^a	LW^{ab}	LW^b		

* These numbers are now obsolete: 003002: (P) is no longer considered to be in the P system; it is now 900025. 006009: anti-KEL 9 was subsequently shown to consist of anti-KEL 15 and anti-KEL 20; 016001, 016002, 016003, 016004 (LW1, LW2, LW3 and LW4) were phenotype designations prior to the discovery of anti-LW7.

biosynthetic pathway, but controlled from different loci, e.g. 001001 (A) specificity is governed by the *ABO* gene on chromosome 9, whereas 001005 (H) specificity is controlled by the *Hh* gene on chromosome 19. A system may also include products of genes so closely linked, e.g. *MN* and *Ss*, that hybrids due to unequal nonhomologous crossing-over occur. Numerical abbreviations may be used in texts by omitting sinistral zeros in system and specificity numbers or by substituting the system symbol for the system number, e.g. 5.4 or LU4, respectively, for the Barnes specificity of the Lutheran system (005004).

To avoid confusion with the literature we have felt obliged to tabulate previously numbered specificities or phenotypes. For one reason or another (see subscripts to tables I and II) some of these numbers have become obsolete and for obvious reasons may not be reused. The common denominator of the obsolete 'specificities' is detection by sera with antibodies to high incidence antigens. To avoid confusion in the future, we recommend that such specificities be relegated to

the 900 series (see below) until they have firm blood group system assignment.

Unassigned Specificities

To accommodate low and high incidence antigens that have not been assigned to systems 1–16, we have created a 700 and a 900 series. These are essentially holding files to allow time for the accumulation of adequate data for undisputed assignment to existing or new systems.

The 700 series includes the 37 low incidence antigens (700001–700037, table III) judged to be extant on the basis of availability of pertinent serum and cells. All have been shown to follow a Mendelian inheritance pattern. A number have been excluded from most blood group systems, but await an antithetical relationship to allow expansion to a system. On the other hand, a few, e.g. 700025 (In^a), have an antithetical relationship (900023, In^b), but little information in regards to systems 1–16.

The 900 series includes 27 high incidence specificities (table IV); a number of these are heterogeneous, e.g. 900.2 (Ge), and the interrelationships of others, e.g. 900.4 (Cs^a), 900.8 (Yk^a), 900.9 (Kn^a), 900.15 (McC^a), and 900.17 (Sl^a) are not well defined. Pending resolution of the problems of heterogeneity and interrelationships we have assigned numbers on a class basis.

Alphabetical Designations

With the multitude of blood group antigens being described, it becomes increasingly difficult to coin a unique designation. This is evidenced by the fact that duplications do occur, e.g. the name Hughes has been used for an unassigned low incidence

Table II. Extension of blood group system specificities

No. within system	System symbol/system No.			
	MNS/ 002	RH/ 004	LU/ 005	KEL/ 006
010	Mur	V	Singleton	$U1^a$
011	M^g	E^w	Reynolds	Cote
012	V^r	G	Much	Bockman
013	M^e	Rh^A	Hughes	Sgro
014	Mt^a	Rh^B	Hofanesian	Santini
015	St^a	Rh^C	*Anton	Kx
016	Ri^a	Rh^D	Lu16	'k-like'
017	Cl^a	Hr_0	Delcol	Wk^a
018	Ny^a	Hr		Marshall
019	Hut	hr^s		Sublett
020	Hil	VS		Km
021	M^v	C^G		Kp^c
022	Far	cis CE		Ikar
023	s^D	D^W		
024	Mit	E^T		
025	D antu	*LW		
026	Hop	c-like		
027	N ob	cis cE		
028	En	hr^H		
029	En^aFS	'total Rh'		
030	'N'	Go^a		
031		hr^B		
032		$\overline{R}^N$		
033		R^{oHar}		
034		total Bastiaan		
035		$\overline{R}^N$-like		
036		Be^a		
037		Evans		
038		Duclos		
039		C and Hr_0-like		
040		Tar		
041		RH41		
042		hr^H-like		
043		Crawford		
044		Nou		
045		Riv		

* These numbers are now obsolete: 004025: LW has been assigned system number 16; see table I. 005015: Anton is no longer considered to be in the Lutheran system; it will be given a 900 number.

Table III. 700 series: low incidence antigens not assigned to systems 1–16

No.	Symbol	Name
001	Wr^a	Wright
002	By	Batty
003	Chr^a	Christiansen
004	Sw^a	Swann
005	Bi	Biles
006	Bx^a	Box
007	Ls^a	Lewis II
008	Tr^a	Traversu
009	Wb	Webb
010	Bp^a	Bishop
011	Or	Orriss
012	Gf	Griffiths
013	Wu	Wulfsberg
014	Jn^a	
015	Rd	Radin
016	Heibel	
017	To^a	Torkildsen
018	Pt^a	Peters
019	Re^a	Reid
020	An^a	Ahonen
021	Je^a	Jensen
022	Mo^a	Moen
023	Hey	
024	Rl^a	Rosenlund
025	In^a	Indian
026	Fr^a	Froese
027	Rb^a	Redelberger
028	Li^a	Livesey
029	Vg^a	Van Vugt
030	Wd^a	Waldner
031	Dh^a	Duch
032	POLLIO	
033	Os^a	
034	Hg^a	Hughes
035	Tc^b	
036	Tc^c	
037	NFLD	

Table IV. 900 series: high incidence specifities not assigned to systems 1–16

No.	Symbol	Name
001	Vel	
002	Ge	Gerbich
003	Lan	Langereis
004	Cs^a	Cost
005	Gy^a	Gregory
006	At^a	August
007	Ch	Chido
008	Yk^a	York
009	Kn^a	Knops
010	Jo^a	Joseph
011	Hy	Holley
012	Jr^a	
013	Cr	Cromer
014	Rg	Rodgers
015	McC^a	McCoy
016	Ok^a	
017	Sl^a	
018	JMH	
019	Er^a	
020	Tc^a	
021	Dr	
022	Es	
023	In^b	
024	Fritz	
025	P	
026	I	
027	i	

antigen (700.34) as well as for a high incidence Lutheran antigen (5.13). To assist in the avoidance of literal and/or phonetic duplications, the Working Party maintains a listing of all alphabetical symbols that have been used, whether or not they appear in the tables of this report. Authors are urged to consult any member of the Working Party to determine, before publication, the individuality of new designations.

For its efforts to be meaningful, the Working Party is dependent on the cooperation of colleagues. There are undoubtedly errors of omission in this report and we would appreciate these being brought to our attention. For new designations, we recommend the use of a minimum of 3 capital letters to allow adequate variety. It would be

preferable to include numerical as well as alphabetical designations in the documentation of new specificities; submissions to the Working Party for numerical designations will receive prompt attention.

The next meeting of the Working Party will be held in Sydney, Australia, in 1986; the agenda will include discussions about designations for phenotypes, for monoclonal antibodies with blood group specificity, and for mimicking specificities. We would welcome comments and suggestions as well as nominations for Working Party membership.

References

1 Allen, F. H., Jr.; Anstee, D. J.; Bird, G. W. G.; et al.: ISBT Working Party on Terminology for Red Cell Surface Antigens. Preliminary report. Vox Sang. *42:* 164–165 (1982).

2 Allen, F. H., Jr.: Report of the ISBT Working Party on Terminology for Red Cell Surface Antigens. ISBT Newsletter. No. 18, April 1983.

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