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MEETING REPORT

International Society of Blood Transfusion Committee on terminology for red cell surface antigens: Vancouver Report

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The Committee met in Vancouver, Canada during the 2002 International Society of Blood Transfusion (ISBT) Congress. Some changes to the classification documented in Blood Group Terminology 1995 [1], and updated in 1996 [2], 1998 [3] and 2000 [4], were agreed and are described below. The full updated classification can be found on the Blood Group Terminology website at http://www.iccbba.com/page25.htm

New antigens were added to the Rh, Lutheran, Kell, Cromer and Knops systems. In addition, three new systems – I, Globoside and GIL (systems 27–29) – were created (Table 1). A new terminology for epitopes of RH1 (D) and variant RH1 antigens was agreed, and this will be published separately [5].

Rh system

Three new antigens were added to the Rh system:

(1) The number RH53 was confirmed for JAHK, a low-incidence antigen associated with the rare Rh phenotype, r^G [6].

(2) RH54 was awarded to DAK, a low-incidence antigen associated with DIIIa, DOL and some other rare Rh phenotypes [7].

(3) The low-incidence antigen, LOCR (700053), is associated with weak expression of RH4 (c) and RH5 (e). Recent family studies have provided sufficient evidence for LOCR to become RH55 [8]. 700053 is obsolete.

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Lutheran system

The absence of a new Lutheran antigen of very high incidence is associated with homozygosity for a mutation in *LU* encoding Asp94Glu [9]. The new antigen, provisionally numbered LU21, has been distinguished serologically from all other Lutheran antigens, except LU16 and DNA from an LU:–16 individual encoded Asp94. This is a provisional assignment because LU:–21 has only been found in one individual.

Kell system

The high-incidence antigen RAZ was confirmed as KEL27. The KEL:–27 phenotype is associated with homozygosity for a mutation in *KEL* encoding Glu299Lys [10].

Scianna system

Following the discovery that the Scianna antigens are expressed by the red-cell adhesion protein human ERMAP, with SC1 and SC2 representing a Gly57Arg polymorphism, expression of the low-incidence antigen Rd (700015) was found to be associated with a mutation in *ERMAP*, encoding Pro60Ala [11]. This provides confirmation that Rd belongs to the Scianna system and Rd has become SC4. 700015 is obsolete.

Cromer system

An antigen of very high incidence, named GUTI, has been given the number CROM11. The CROM:–11 phenotype is associated with a mutation encoding Arg206His in the CD55 glycoprotein [12].

Table 1 New blood group antigens and systems

System			Antigen					
No.	Name	Symbol	Symbol	No.	No.	Previous no.	Gene	Ref.
004	Rh	RH	JAHK	004053	RH53	None	*RHD/RHCE*	[6]
			DAK	004054	RH54	None	*RHD/RHCE*	[7]
			LOCR	004055	RH55	700053[b]	*RHD/RHCE*	[8]
005	Lutheran	LU	LU21	005021[a]	LU21[a]	None	*LU*	[9]
006	Kell	KEL	RAZ	006027	KEL27	None	*KEL*	[10]
013	Scianna	SC	Rd	013004	SC4	700015[b]	*ERMAP*	[11]
021	Cromer	CROM	GUTI	021011	CROM11	None	*DAF*	[12]
022	Knops	KN	SI3	022008[a]	KN8[a]	None	*CR1*	[13]
027[c]	I	I	I	027001	I1	207001[b]	*GCNT2*	[14]
028[c]	Globoside	GLOB	P	028001	GLOB1	209001[b]	[d]	[16,17]
029[c]	GIL	GIL	GIL	029001	GIL1	None	*AQP3*	[20]

[a]Provisional number; [b]obsolete number; [c]new system; [d]no symbol has been awarded by the HUGO Gene Nomenclature Committee.

Knops system

Serological and molecular investigations of complement receptor type 1 (CR1, CD35), the protein that bears the Knops blood group antigens, has revealed that KN4 (SI^a) requires Arg1601, that KN7 (Vil) requires Gly1601 on CR1, and that a new determinant requires both Arg1601 and Ser1610 [13]. The symbols for KN4 and KN7 will become SI1 and SI2, respectively, replacing SI^a and Vil. The new antigen will be SI3 and has been given the number KN8, but only provisionally because further complications are predicted.

I system

The gene encoding the *N*-acetylglucosaminyltransferase responsible for converting i-active straight chains to I-active branched chains has been cloned and some mutations responsible for the i adult phenotype identified [14,15]. I antigen, previously 207001, has become I1 (027001), the only antigen of a new system (System 27) with the name and symbol I. 207001 has become obsolete. The i antigen, the precursor of I, will remain as 207002. This leaves Collection 207 containing only one antigen, but that anomaly will be resolved when a separate carbohydrate collection is created.

Globoside system

The gene encoding the *N*-acetylgalactosaminyltransferase (globoside synthase) that is responsible for converting P^k (209002) to P (209001, globoside), has been cloned and inactivating mutations responsible for the P^k (P-deficient) phenotype have been identified [16,17]. P has become GLOB1 (028001), the only antigen of a new system (System 28) with the name Globoside and the symbol GLOB. 209001 has become obsolete.

The gene encoding the galactosyltransferase responsible for synthesis of P^k has been cloned and mutations responsible for the p phenotype identified [18]. Consequently, P^k could represent another new blood group system. However, until the relationship of this gene to the P1 polymorphism is clarified, it was considered prudent to leave P^k as 209002.

The creation of the I and Globoside systems means that these two systems have identical symbols – I and GLOB – to those of Collections 207 and 209. This should not cause confusion, however, as I1 and GLOB1 cannot refer to 207001 and 209001 because those numbers are now obsolete.

GIL system

GIL is an antigen of high incidence that was never numbered because it had not been shown to be inherited [19]. GIL has been shown to be located on the glycerol transporter, aquaporin 3, and the GIL–phenotype results from an inactivating mutation within the *AQP3* gene [20]. *AQP3* is present on chromosome 9p13, so GIL is genetically discrete from all other blood-group systems. GIL has become GIL1 (029001), the only antigen of a new system (System 29) with the name and symbol GIL.

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Appendix 1

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