

MEETING REPORT

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

G. L. Daniels (Chair), J. P. Cartron, A. Fletcher, G. Garratty, S. Henry, J. Jørgensen, W. J. Judd, C. Levene, M. Lin, C. Lomas-Francis, J. J. Moulds, J. M. Moulds, M. Moulds, M. Overbeeke, M. E. Reid, P. Rouger, M. Scott, P. Sistonen, E. Smart, Y. Tani, S. Wendel & T. Zelinski

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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 Recent family studies have provided sufficient evidence for LOCR to become RH55 [8]. 700053 is obsolete.

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	<i>RHD/RHCE</i>	[6]
			DAK	004054	RH54	None	<i>RHD/RHCE</i>	[7]
			LOCR	004055	RH55	700053 ^b	<i>RHO/RHCE</i>	[8]
005	Lutheran	LU	LU21	005021 ^a	LU21 ^a	None	<i>LU</i>	[9]
008	Kell	KEL	RAZ	006027	KEL27	None	<i>KEL</i>	[10]
013	Scianna	SC	Rd	013004	SC4	700015 ^b	<i>ERMAP</i>	[11]
021	Cromer	CROM	GLTI	021011	CROM11	None	<i>DAF</i>	[12]
022	Knops	KN	Sl3	022008 ^c	KN8 ^a	None	<i>CR1</i>	[13]
027 ^c	I	I	I	027001	I1	207001 ^b	<i>GCNT2</i>	[14]
028 ^c	Globoside	GLOB	P	028001	GLOB1	209001 ^b	^d	[16,17]
029 ^c	GIL	GIL	GIL	029001	GIL1	None	<i>AQP3</i>	[20]

^aProvisional number; ^bobsolete number; ^cnew system; ^dno 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 (Vi1) 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 Vi1. 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

Working Party membership

Name	Postal Address	E-mail address
Prof. J. P. Cartron	Institut National de la Transfusion Sanguine, 6 rue Alexandre-Cabanel, F-75739 Paris Cedex 15, France	cartron@idf.inserm.fr
Dr G. L. Daniels	Bristol Institute for Transfusion Sciences, Southmead Road, Bristol BS10 5ND, UK	geoff.daniels@nbs.nhs.uk
Dr A. Fletcher	Growing your Knowledge, PO Box 716, Spit Junction, NSW 2088, Australia	fletanne@bigpond.net.au
Prof. G. Garratty	American Red Cross Blood Services, Los Angeles-Orange Counties Region, 1130 South Vermont Avenue, Los Angeles, CA 90006, USA	garratty@usa.redcross.org
Prof. S. Henry	Glycoscience Research Centre, Auckland University of Technology, Private Bag 92006, Auckland 1020, New Zealand	kiwi@aut.ac.nz
Dr J. Jørgensen	Regional Blood Transfusion Center, Department of Clinical Immunology, University Hospital, Skejby, DK-8200 Århus N, Denmark	jjo@skt.saa.dk
Prof. W. J. Judd	Department of Pathology, University Hospitals UH-2G332, 1500 E Medical Center Drive, Ann Arbor, Michigan 48109-0054, USA	johnjudd@med.umich.edu
Dr C. Levent	Reference Laboratory for Immunohematology and Blood Groups, National Blood Services Centre, Magen David Adom, Tel Hshomer 52621, Israel	cyril@cc.huji.ac.il
Dr M. Lin	Mackay Memorial Hospital, 92, Sec. 2, Chung Shan N Road, Taipei, Taiwan	marilin@ms2.mmh.org.tw
Ms C. Lomas-Francis	New York Blood Center, 310 East 67th Street, New York, NY 10021, USA	clomas-francis@nybloodcentre.org
Mr J. J. Moulds	Ortho-Clinical Diagnostics, 1001 US Highway 202, Raritan, NJ 08869-0606, USA	jmoulds@ocdus.jnj.com
Dr J. M. Moulds	Drexel University College of Medicine, 2900 Queen Lane, Philadelphia, PA 19129, USA	moulds@drexel.edu
Ms M. Moulds	Gamma Biologicals Inc. (subsidiary of Immunocor Inc.), 3700 Mangum Road, Houston, TX 77092, USA	mmoulds@immunocor.com
Dr M. A. M. Overbeek	Central Laboratory of the Netherlands Red Cross Blood Transfusion Service, PO Box 9190, Amsterdam, the Netherlands	m_overbeek@clb.nl
Dr M. E. Reid	New York Blood Center, 310 East 67th Street, New York, NY 10021, USA	marion_reid@mybc.org
Dr Ph. Rouger	Centre national de Référence pour les Groupes sanguins, CNTS St Antoine, 53 boulevard Diderot, F-75571 Paris Cedex 13, France	tcb_ints@ints.fr
Dr M. Scott	International Blood Group Reference Laboratory, Southmead Road, Bristol BS10 5ND, UK	marion.scott@nbs.nhs.uk
Dr P. Sistonen	Finnish Red Cross Blood Transfusion Service, Kivihaantie 7, SF-00310, Helsinki 31, Finland	pertti.sistonen@bts.redcross.fi
Mrs E. Smart	South African National Blood Service, East Coast Region, Private Bag X9044, Pinetown 3600, South Africa	smarte@ecr.sansb.org.za
Dr Y. Tani	Osaka Red Cross Blood Center, Morinomiya 2-4-43, Joto-ku, Osaka, 535-8505, Japan	taniy@sannet.nc.jp
Dr S. Wendel	Blood Bank, Hospital Sirio-Libanes, Rua Dona Adma Jafet 91, 29 Andar, São Paulo, Brazil	swwendel@uninet.com.br
Dr T. Zelinski	Rh Laboratory, Room P009, Pathology Building, 770 Bannatyne Avenue, Winnipeg, Manitoba R3E 0W3, Canada	zelinski@ms.umanitoba.ca