

## Red Cell Immunohaematology

### What is RCI?



- National support for Transfusion Laboratories
- ROI labs located in Blood Centres in Birmingham, Bristol (Filton), London (Collindale, Tooting), Liverpool and Sheffield
- Liverpool hosts the NFFB and reagents
- Filton hosts the IBGRL
- Majority of blood transfusions can be facilitated by hospitals, BUT..



BMS

## BCSH Guidelines 2012...



- If there is any doubt concerning the identity of any antibodies present, or the ability to exclude clinically significant antibodies, a sample should be sent to a red cell reference laboratory.
- Laboratories that are not registered for antibody investigation in an accredited external quality assurance scheme should refer samples from all patients that have given positive results in the antibody screen to a laboratory that is registered for antibody identification.

### BCSH Guidelines 2012...

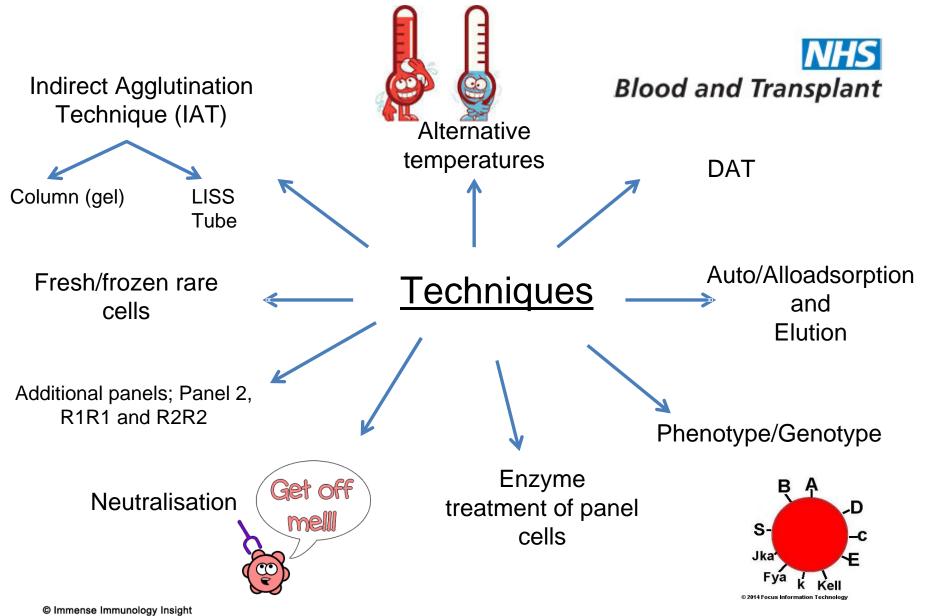


- If a patient is known to have (ever) formed a red cell alloantibody, each new sample must be fully tested to exclude the presence of further alloantibodies.
- When one antibody specificity is detected it is essential that the presence or absence of additional clinically significant alloantibodies is established.

## Why Refer to RCI?



- Rare/ Anomalous ABO/ D blood grouping
- Antibody Confirmation/Identification
- Complex mixtures of antibodies
- Antenatal Investigations;
  - Quantification and titration
  - FMH Investigation
  - Provision of suitable blood for delivery/IUT
- AIHAs/ DAT positive patients
- Suspected Haemolytic Transfusion Reactions
- Advice!
- Panic?







- Via NHSBT Liverpool and in liaison with the International Blood Group Reference Laboratory (IBGRL) ROI have access to additional reagents that may not be available to Hospital Labs;
  - Reference antibody identification panels Rare cells to confirm or exclude specificity
  - Rare antisera for phenotyping
  - National Frozen Cell Bank
  - National / international rare cell exchange
  - WHO International Rare Cell Donor Panel

## BCSH Guidelines 2012...



- Antibody specificity should only be assigned when the plasma is reactive with at least 2 examples of reagent red cells expressing the antigen and non-reactive with at least 2 examples of reagent red cells lacking the antigen.
- When one antibody specificity has been identified, it is essential that the presence or absence of additional dinically significant antibodies should be established. This can be demonstrated by choosing reagent red cells that are negative for the recognised specificity but positive for other antigens to which clinically significant antibodies may arise.

Jess Gill

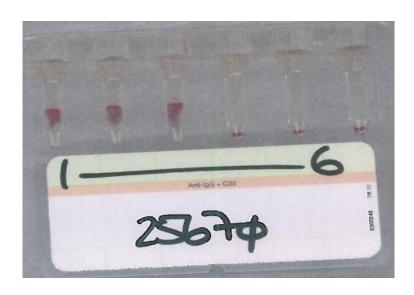


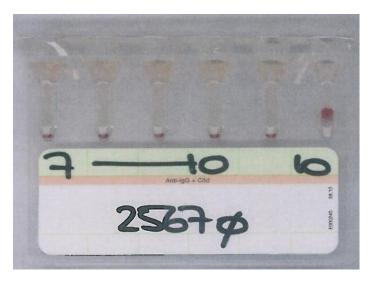


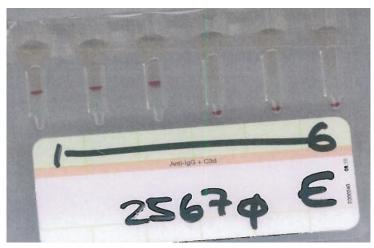
 Failure to recognise all of the antibody specificities within a sample can lead to a haemolytic transfusion reaction.
 Specificities should be excluded using red cells having homozygous expression of the relevant antigen. A single example only of each phenotype is sufficient for exclusion.

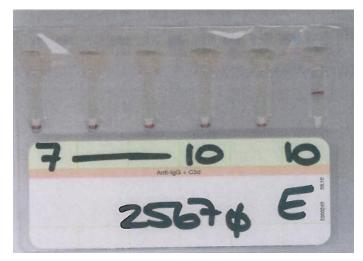


## **Example Cases**









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	Rh	M	N	s	5	P1	Lu*	K	k	Kp*	Le*	Leb	Fy*	Fy	Jk*	Jk	Other	IAT	ENZ-	
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2	R <sub>1</sub> R <sub>1</sub>	+	+	+	0	0	0	0	+	0	+	0	+	0	+	0		8	5	
3	R <sub>2</sub> R <sub>2</sub>	0	+	0	+	3	0	0	+	0	+	0	0	+	+	0		5	5	
4	r'r	+	0	+	0	3	0	0	+	0	0	+	0	+	+	0	Cob+	0	0	
5	r"r	+	0	+	0	0	0	0	+	0	0	+	+	0	0	+		0	0	
6	rr	+	0	0	+	0	0	+	0	0	0	+	0	+	+	0		0	10	
7	rr	+	0	+	0	0	0	+	+	0	0	0	w	0	+	0		0	Q	
8	rr	0	+	0	+	2	0	0	+	+	0	+	+	0	+	0		0	0	
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		0	0	
10	rr	+	0	+	0	2	+	0	+	0	+	0	0	+	0	+	Cob+	0	0	
Auto																		0	0	
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Jess Gill



# Have a go yourself!

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Sample	Name					Reques	tor		+			Data	base R	ef No.				Tested by				
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Panel F	apainised i	n Alsev	ers	R154 33	12	Panel P	apainis	ed in Ce	llStab	R153 3	312	Panel	Papani	sed in Co	ellMedia	R173	3312	EXPIRY D	ATE: 2014.	12.11		
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2	R <sub>1</sub> R <sub>1</sub>	+	0	+	0	2	0	+	+	0	0	+	0	+	+	0		0	0			
3	R <sub>2</sub> R <sub>2</sub>	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		3	5			
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		3	5			
5	r"r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	3	5			
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	3	5			
7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		3	5			
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		3	5			
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		3	5			
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Pipette batch No's

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2	R1wR1 R1wR1	+	0 +	0	0	3	0	0	+	0	0	0	0	0	0	0 +		3				
3	R1RZ	+	+	+	0	0	0	0	+	0	0	+	+	0	+	0		3				
4	R1RZ	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		0				
5	Ror	0	+	0	+	4	0	0	+	0	0	0	0	0	+	0	V+ VS+	3				
6	R1r'	0	+	0	+	4	0	+	0	0	0	+	+	0	0	+		3				
7	R1R1	+	0	+	0	3	0	+	+	0	0	+	0	+	+	0		0				
8	R1R1	0	+	0	+	0	0	0	+	+	+	0	+	0	+	0		3				
9	R1R1	+	0	0	+	2	+	0	+	0	+	0	0	+	0	+		0				
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2	R <sub>1</sub> R <sub>1</sub>	+	0	+	0	2	0	+	+	0	0	+	0	+	+	0		0	0			
3	R <sub>2</sub> R <sub>2</sub>	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		0	0			
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		0	0			
5	r"r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	0	0			
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	0	0			
7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		0	0			
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		WK	1			
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		0	0			
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NH2R	i Reagent	s P	anel	1						Antiboo	ly Inve	estigati	ion W	orkshee	et												
Sample	Name					Reques	stor					Data	abase F	Ref No.				Teste	d by	T	pi.						
Date of	Birth					Hosp n	0					Sam	ple No	.	-			Date	rested				-				
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Panel F	apainised	in Alseve	ers	R154 331	12	Panel F	apainis	ed in Ce	IIStab	R153 3	312	Panel	Papani	ised in Co	ellMedia	R17	3 3312	EXPIR	RY DAT	E: 20	14.12.11						
4	Rh	M	N	S	s	P1	Lu*	K	k	Kp*	Le*	Leb	Fy	Fy <sup>b</sup>	Jkª	Jkb	Other	14	TE	N2	TUBE	RUATE					
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3	R <sub>2</sub> R <sub>2</sub>	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		1	5	0	0	D					
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	. +		(		0	0	0					
5	r"r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-		0	0	0	1					
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	. (	0	0	0	WK					
7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+			0	0	0	0					
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+				0	0	. 0					
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Effective: 11/04/13

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Product	Sample	Name					Reques	tor					Data	base R	ef No.				Tested by	'				
Panel in Alsevers	Date of	Birth			7		Hosp n	0					Sam	ple No.		1			Date Test	ed				
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Conclusion	4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		0	0	0		0	
7	5	r"r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	3	0	0		3	
B	6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	1	0	0		2	
9	7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		0	0	0		0	
10   rr	8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		3	0	0		3	
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Dilution  Cell Id  BRND POS  C*E+E-e+K-  Anti- Anti- Anti- Archive Anti- Anti- Archive  DAT Batch No  PS IgG IgA IgM C3c C3d Ctl Entered into Database by:  Authorised by.  Reagent Batch	1																							_
Dilution  Cell Id  BRND POS  C*E+E-e+K-  Anti- Anti- Anti- Archive Anti- Anti- Archive  DAT Batch No  PS IgG IgA IgM C3c C3d Ctl Entered into Database by:  Authorised by.  Reagent Batch	44 4			ia .														34	- 4				-	
Dilution  Cell Id  BRND POS  C*E+E-e+K-  Anti- Anti- Archive  Anti Archive  DAT Batch No  PS IgG IgA IgM C3c C3d Ctl Entered into Database by:  Authorised by.  Reagent  Batch	OL .	100										- 6			-			2						
Diusion Cell Id BRND POS C*E+E+K*  Anti- Anti- Archive Ant						-																		
Anti-	Antibo	dy Titre	Access to the second					American		***************************************					Grou	р								
Archive Anti Archive DAT Batch No  PS IgG IgA IgM C3c C3d Ctl Entered into Database by:  Reagent Batch	Dilution					1					8.		Cell	ld	. 6	BRND	Pos		CTC	+Eet	K-			
Archive DAT Batch No  PS IgG IgA IgM C3c C3d CtI Entered into Database by: Authorised by	Anti-		2.0							-				- :			5						. :	
Archive DAT Batch No  PS IgG IgA IgM C3c C3d Ctl Entered into Database by: Authorised by.  Reagent Batch	Archive					-						1			PATIE	ENT 4	:45	de ord u	ALE SI	EEN I	WITH	Broo	00	
DAT Batch No           PS         IgG         IgA         IgM         C3c         C3d         Ctl         Entered into Database by:         Authorised by.           Reagent         Batch	Anti								-			100	-		GROU	BINA	DISC	REPANC	4 (SEE	ATTA	CHED	)		
PS         IgG         IgA         IgM         C3c         C3d         Ctl         Entered into Database by:         Authorised by           Reagent Batch	Archive			1		T Des									5 9									
Reagent Batch Database by:	DAT E	Batch No												-										
Reagent Batch Database by: Authorised by	PS	3	IgG	T	IgA		IgM		C36		C3	d	C	tl	Enter	ed into								
Batch			-																Au	thorise	d by			
	Reagen	it			T									T					T					_
	Batch No's								7															

Jess Gill

Anti-A	Anti-B	Anti-Dt	ANTI D 2	A1 cells	B cells
0	5	5	5	5	3

Controls Arr	5	0	0	0
Brr	0	5	0	0
OR1r	0	0	5	5

Sample	Name					Reques	tor					Data	base R	ef No.				Tested by					
Date of	Birth			17	- 1	Hosp n						-	ple No.					Date Test	ed			-	
Produc	And the second second			Lot No.		Produc	t			Lot No.		Produ	ict	,		Lot A		Product				t No.	
	n Alsevers Papainised i	n Alsev	ers	R144 33 R154 33			n CellSta apainise		IIStab	R143 3			in Celli Papani	sed in Co	ellMedia		3312 3312	Panel in L EXPIRY D		14.12.11	I Ri	46 331	-
1	Rh	М	N	s	s	P1	Luª	К	k	Kpª	Leª	Leb	Fyª	Fy⁵	Jk*	Jkb	Other	IAT	EN2				
1	R <sub>1</sub> WR <sub>1</sub>	0	+	0	+	3	0	0	+	0	0	+	+	0	0	+	. 79	3	5				
2	R <sub>1</sub> R <sub>1</sub>	+	0	+	0	2	0	+	+	0	0	+	0	+	+	0	- 1	3	5				
3	R <sub>2</sub> R <sub>2</sub>	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		3	5				
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		3	5				
5	r"r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	3	5	31			
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	3	5				
7	rr.	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		3	5				
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		3	5				
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		3	5		100		
10	rr	0	+	0	+	3	+	0	+	0	0	0	+	0	+	0		3	5				
Auto				-	-	-								-				0	0		-		-
. 7		+1		1								<b>!</b>							13,				
13						1				-	-								-	19.			
Antibo	dy Titre										-			Group	p			Pheno					_
Dilution:			-		T	1		3 ,5				Cell	ld		ORN	D Po	S	Pheno	+ E-	2+K-	Sis	Fy(a.	6-)
Anti-	f - 1							-				1 3			lusion								
Archive	Y Jun T		-/5	100					1					PATIE	NTS:	554	EAR OLD	. FROM	BLAC	IC AFR	MADE	BACK	GROU
Anti			-					-					4										
Archive				1.1							15												
DAT E	Batch No				1								10										
P	S	IgG	-	IgA	-	IgM	di I	C30	:	C3	d	Ct	tl		ed into			Aut	thorise	d by			
Reager	it			1						T			T							1			
Batch						-				1										*	-		

	T Reagents		anel							MILLIDO	ay mive	suyau	OII WAC	orkshe	61						
Sample	e Name					Reques	tor					Data	abase R	ef No.				Tested by			
Date of	Birth					Hosp n	0				-	Sam	ple No.					Date Test	ed	-	
Produc	et			Lot No.		Produc	t			Lot No		Produ	ct			Lot N	lo.	Product		IL	ot No.
Panel i	n Alsevers			R144 33		Panel in	n CellSta			R143 3	312	Panel	in CellN			R163	3312	Panel in L		R	146 3312
Panel I	Papainised i	n Alseve	ers	R154 33	12	Panel P	apainise	ed in Ce	IIStab	R153 3	312	Panel	Papani	sed in C	ellMedia	R173	3312	EXPIRY D	ATE: 2014		
2.5	Rh	M	N	S	s	P1	Lu*	K	k	Kpª	Leª	Le <sup>b</sup>	Fyª	Fy <sup>b</sup>	Jk <sup>a</sup>	Jkb	Other	IAT	EN2	1;1	PBS 1:1 CONTROL
1	R <sub>1</sub> <sup>w</sup> R <sub>1</sub>	0	+	0	+	3	0	0	+	0	0	+	+	0	0	+		3	0	٥	2
2	R <sub>1</sub> R <sub>1</sub>	+	0	+	0	2	0	+	+	0	0	+	0	+	+	0	11	2	0	0	2
3	R <sub>2</sub> R <sub>2</sub>	0	+	. 0	+	0	0	0	+	0	0	+	0	+	0	+		2	0	0	2
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		3	0	0	3
5	r"r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	2	0	0	2
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	D	0	0	0
7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		2	0	0	2
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		3	0	0	3
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		3	0	0	2
10	rr	0	+	0	+	3	+	0	+	0	0	0	+	0	+	0		2	0	0	2
Auto													1		-			0	0		
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										1											
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-															-		-				
Antibo	dy Titre		-					-		-				Grou	D			Pheno			
Dilution:						T			T	T	T	Cell	ld		ARNO	nec	à.	C	ir E et	K-R+	
Anti-	1			- 10					-				- 1	Conc	lusion	1.5	-				_
Archive	-	- 1			$\top$				$\rightarrow$	-	+			PATIE	WT 6:	45	12 OLD FE	MALE	POST O	PERATIV	E
Anti														177							
Archive					1				_	-		+									
DAT E	Batch No								_				-								
P		IgG	Т	IgA		IgM		C3c		C3	4	Ct	1		4 5-4-						
		.90	-	·g·	-	19111		000	-		-		-		ed into			Aut	horised b	oy	
Reager										Т		25		Dutte	7000 0,			1	11011000	7	