hr Problems

American Red Cross

Is this a discussion of your Human Resources nightmares?

We are actually talking about the Rh Blood Group System!

Hr and hr Antigens

Hr_o (Rh17)
Hr or Hr^S (Rh18)
Hr^B (Rh34)

These antigens are extremely high prevalence with an incidence of >99.9%. The antigens are lacking on *Rh-deletion* haplotypes.

hr^B (Rh31)
hr^S (Rh19)

These antigens have an incidence of about 98%, just like the e antigen (Rh5). These antigens are considered e variants. Since the antigens are not as prevalent, we encounter antibodies to these antigens on a more frequent basis.

The History of hr^S and hr^B

The antigen hr^S was first identified in 1960. The serum of a Bantu woman, Mrs. Shabalala contained an antibody which reacted with all cells that possessed E or e antigen. The antibody which remained after adsorption with R2R2 cells was named anti-hr^S.

The antigen hr^B was not identified until 1972 and was found in a South African woman named Mrs. Baastian. Reactivity was very similar to anti-hr^S.

Partial Expression of the e Antigen

"In the majority of, but not quite all cases, e and anti-e in Whites, are straightforward. The antibody can be formed by E+e- (usually R2R2) people and when made, reacts with all e+ samples. In Blacks, the story is rather different for some of them, who have red cells that type as e+, make antibodies that closely resemble anti-e (or anti-f or anti-rh_i), yet which do not react with the antibody makers' own red cells. In this respect, it seems that the e antigen must involve many epitopes and that the state of lacking some of them, that is having red cells that carry partial e, is more common in Blacks than in Whites."

Applied Blood Group Serology, 4th edition; Peter D Issitt, David J. Anstee; Chapter 12, pg 368

Can we think of partial e antigen the same way as partial D antigen?

No we can't!

- Partial D has very specific definitions and the epitopes are well defined.
- Partial e seems to be made in a more individualistic manner. The antigens and antibodies are much more difficult to define.

Partial Expression of the e Antigen

The e antigen must involve many epitopes and the state of having red cells that carry partial e antigen is more common in African-Americans than in Whites.

Cells that lack one epitope of e are more than likely to lack *more* than one epitope. This brings in a lot of variation when looking at a partial e antigen.

An added complication is that not all red cell samples called hr^S- or hr^B-, or all antibodies called anti-hr^S or anti-hr^B, are as alike as the names imply. Examples frozen in Reference and research laboratories over the years have revealed that many examples of "anti-hr^B" are incompatible with cells identified as "hr^B-".

The safest way to report these antibodies without extensive serological and molecular testing is

"anti-e-like".

Laboratory Management of e-like antibodies

American Red Cross

Could my patient have an anti-e-like antibody?

- The patient would type as e+ .
- Anti-e (or anti-f or anti-rh_i) is identified in the serum.
- The DAT is negative.
  - *CAUTION: the patient's DAT may be positive due to an autoantibody, a transfusion reaction (is anti-e identified in the eluate too?), or just because nothing is easy in the Blood Bank!*
- The patient's race would most likely be African-American.

What about transfusion recommendations?

- Is your patient E+? Your answer is easy:

  Transfuse e- units (R2R2)

- If your patient has anti-E already, the answer is more difficult. Precise information about the clinical significance of anti-hr^B and anti-hr^S is limited. Even more limited is the availability of compatible units for these patients. Throw in the additional complication that many of these patient's red cells also possess a partial D antigen (and so they can make allo-anti-D as well), and transfusion becomes very difficult. In an emergency, transfuse a patient with anti-D, -E, and -e-like antibodies with D-, E- e+ units.

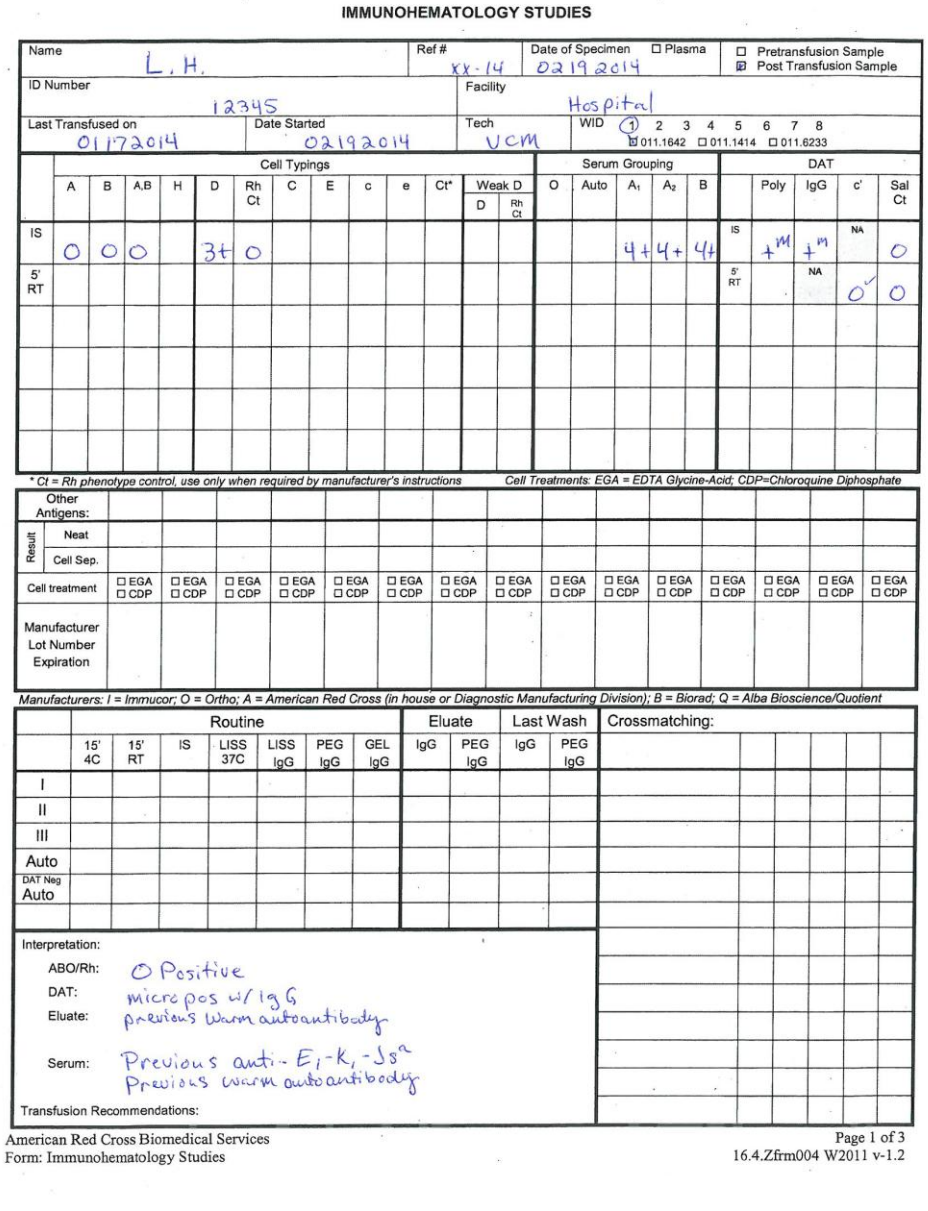
But we need compatible units!!!

- Molecular testing can identify patients and blood donors with altered Rhce/RhD.
- The American Rare Donor Program keeps a file of all the donors for whom they have molecular testing results which indicate partial e phenotype. If a request comes in to the ARDP, they can match donor to patient based on the exact molecular types of each. The ARDP notifies each member Blood Center who has compatible donors in order for them to ship products where they are needed or recruit their donors.
- Unfortunately this is not a quick process, and patients may go untransfused or need incompatible blood.

Case study 1

This sample was from an African American sickle cell patient with a previously identified anti-E, -K, and -Js^{a} underlying a warm autoantibody. We had not tested a sample from this patient up since 2009.

The patient had been transfused on 01/17/2014, and the specimen was dated 02/19/2014.



IMMUNOHEMATOLOGY STUDIES

Name: L. H. | Ref #: XX-14 | Date of Specimen: 02192014 | ☐ Plasma | ☐ Pretransfusion Sample | ☑ Post Transfusion Sample

ID Number: 12345 | Facility: Hospital

Last Transfused on: 01172014 | Date Started: 02192014 | Tech: VCM | WID: (1) 2 3 4 5 6 7 8 ☒ 011.1642 ☐ 011.1414 ☐ 011.6233

	Cell Typings											Weak D		Serum Grouping					DAT				
	A	B	A,B	H	D	Rh Ct	C	E	c	e	Ct*	D	Rh Ct	O	Auto	A_1	A_2	B		Poly	IgG	c'	Sal Ct
IS	O	O	O		3+	O										4+	4+	4+	IS	+M	+M	NA	O
5' RT																			5' RT		NA	O✓	O

* Ct = Rh phenotype control, use only when required by manufacturer's instructions

Cell Treatments: EGA = EDTA Glycine-Acid; CDP=Chloroquine Diphosphate

Other Antigens:																	
Result: Neat																	
Result: Cell Sep.																	
Cell treatment	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP
Manufacturer Lot Number Expiration																	

Manufacturers: I = Immucor; O = Ortho; A = American Red Cross (in house or Diagnostic Manufacturing Division); B = Biorad; Q = Alba Bioscience/Quotient

	Routine							Eluate		Last Wash		Crossmatching:
	15' 4C	15' RT	IS	LISS 37C	LISS IgG	PEG IgG	GEL IgG	IgG	PEG IgG	IgG	PEG IgG	
I												
II												
III												
Auto												
DAT Neg Auto												

Interpretation:

ABO/Rh: O Positive

DAT: micro pos w/ IgG previous warm autoantibody

Eluate:

Serum: Previous anti-E, -K, -Js^{a} Previous warm autoantibody

Transfusion Recommendations:

American Red Cross Biomedical Services
Form: Immunohematology Studies

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American Red Cross

Case study – could this be an anti-e-like antibody?

A selected cell panel of E-, K-, Js(a-) cells was tested. Looking at the strength of the serum reactivity at PEG/IAT, we noted stronger reactions with the test cells compared to the reactions with the autocontrol. The eluate was reactive with all cells tested.

Patient's Name L.H.
Patient's Number 12345
Date: Collected 02192014 Date: Tested 02192014

SELECTED PANEL 2:53 pm, 4/11/2014
American Red Cross, Missouri-Illinois Region
4050 Lindell, St. Louis, MO 63108

Technologist: UCM

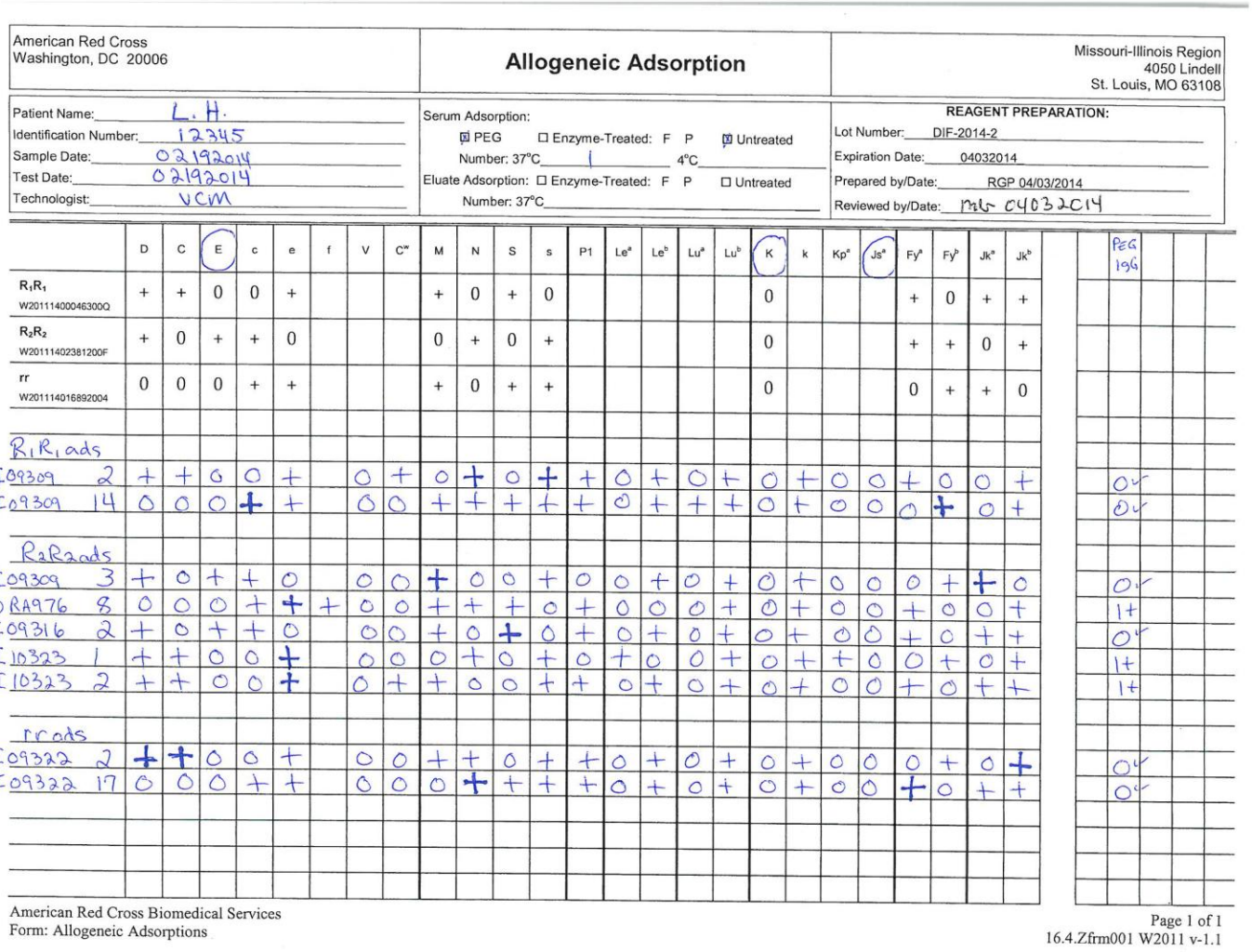
	Supplier Lot #	Donor/ Vial#	RhHr								Kell					Duf		Kid		Lew		P	MN				Lut		X	Additional Antigens	Patient's Plasma Test Results			
			D	C	c	E	e	f	V	Cw	K	k	Kpa	Kpb	Jsa	Jsb	Fya	Fyb	Jka	Jkb	Lea	Leb	P1	M	N	S	s	Lua	Lub	Xga		Serum IS	Serum PEG IAT	eluate	
1	Imm-10F 10323	B2065 2	+	+	0	0	+		0	+	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	0	+	0	+	+	Bg(a-)	0	2+	1+	
2	Imm-10F 10323	E294 5	0	+	+	0	+		0	0	0	+	0	+	0	+	0	+	+	+	0	+	0	0	+	0	+	0	+	+	Bg(a-)	0	2+	1+	
3	Imm-10F 10323	V234 8	0	0	+	0	+		+	0	0	+	0	+	0	+	+	0	+	0	0	0	+	+	0	0	+	0	+	0	Bg(a-)	0	2+	1+	
4	Imm-10F 10323	B6449 1	+	+	0	0	+		0	0	0	+	+	+	0	+	0	+	0	+	+	0	0	0	+	0	+	0	+	0	Bg(a-)	0	2+	1+	
5	Ortho A RA976	83095 8	0	0	+	0	+	+	0	0	0	+	0	+	0	+	+	0	0	+	0	0	+	+	+	+	0	0	+	0	Bg+	0	2+	1+	
6	Imm-16 09309	C4638 3	+	0	+	+	0		0	0	+	+	0	+	0	+	0	+	0	+	0	+	0	+	0	0	+	0	+	+	Bg(a+)			1+ M	
																															auto	0	1+ M		

Adsorption studies

Adsorptions were performed using PEG and untreated allogeneic cells.

Following adsorptions, an apparent anti-e was detected in the R2R2 adsorbed serum.

What do we need to do to determine if the patient has developed an allo-anti-e-like antibody or whether the specificity is simply a component of the autoantibody?



American Red Cross
Washington, DC 20006

Allogeneic Adsorption

Missouri-Illinois Region
4050 Lindell
St. Louis, MO 63108

Patient Name: L. H.
Identification Number: 12345
Sample Date: 02192014
Test Date: 02192014
Technologist: VCM

Serum Adsorption:
☒ PEG ☐ Enzyme-Treated: F P ☒ Untreated
Number: 37°C 1 4°C
Eluate Adsorption: ☐ Enzyme-Treated: F P ☐ Untreated
Number: 37°C

REAGENT PREPARATION:
Lot Number: DIF-2014-2
Expiration Date: 04032014
Prepared by/Date: RGP 04/03/2014
Reviewed by/Date: MS 04032014

	D	C	E	c	e	f	V	C^w	M	N	S	s	P1	Le^a	Le^b	Lu^a	Lu^b	K	k	Kp^a	Js^a	Fy^a	Fy^b	Jk^a	Jk^b	PEG 1g
R_1R_1 W20111400046300Q	+	+	0	0	+				+	0	+	0						0				+	0	+	+	
R_2R_2 W20111402381200F	+	0	+	+	0				0	+	0	+						0				+	+	0	+	
rr W20111401689200H	0	0	0	+	+				+	0	+	+						0				0	+	+	0	
R_1R_1 ads																										
I09309 2	+	+	0	0	+		0	+	0	+	0	+	+	0	+	0	+	0	+	0	0	+	0	0	+	0
I09309 14	0	0	0	+	+		0	0	+	+	+	+	+	0	+	+	+	0	+	0	0	0	+	0	+	0
R_2R_2 ads																										
I09309 3	+	0	+	+	0		0	0	+	0	0	+	0	0	+	0	+	0	+	0	0	0	+	+	0	0
ORA976 8	0	0	0	+	+	+	0	0	+	+	+	0	+	0	0	0	+	0	+	0	0	+	0	0	+	1+
I09316 2	+	0	+	+	0		0	0	+	0	+	0	+	0	+	0	+	0	+	0	0	+	0	+	+	0
I10323 1	+	+	0	0	+		0	0	0	+	0	+	0	+	0	0	+	0	+	+	0	0	+	0	+	1+
I10323 2	+	+	0	0	+		0	+	+	0	0	+	+	0	+	0	+	0	+	0	0	+	0	+	+	1+
rr ads																										
I09322 2	+	+	0	0	+		0	0	+	+	0	+	+	0	+	0	+	0	+	0	0	0	+	0	+	0
I09322 17	0	0	0	+	+		0	0	0	+	+	+	+	0	+	0	+	0	+	0	0	+	0	+	+	0

American Red Cross Biomedical Services
Form: Allogeneic Adsorptions

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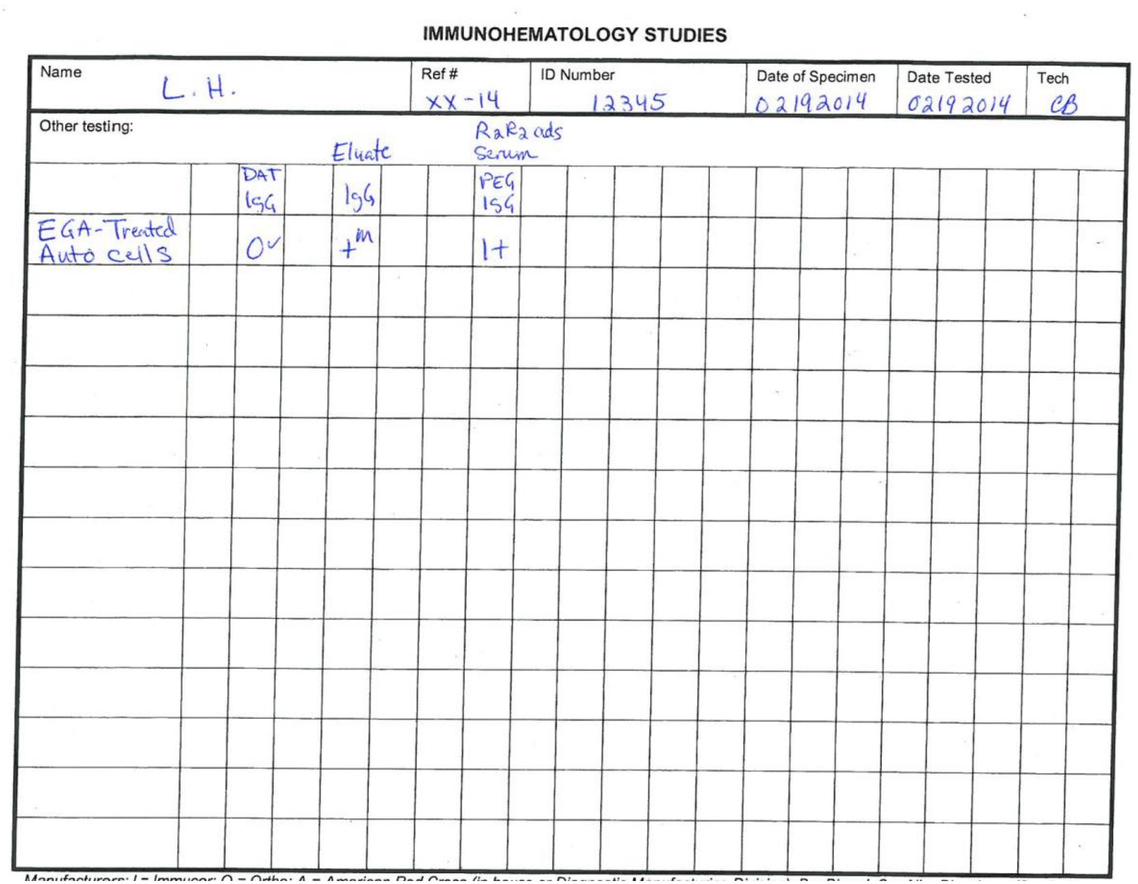
Testing with DAT Negative Autologous Red Cells

A cell separation was performed using hypotonic 0.3% saline. The separated autologous red cells were treated with EGA (EDTA Glycine-Acid) to remove bound IgG. The DAT negative autologous red cells were tested against the patient's eluate and the R2R2 adsorbed serum. The eluate and serum were reactive, confirming the presence of an autoantibody, rather than an alloantibody.

If the DAT negative autologous cells were non-reactive, it would have indicated that the reactivity in the patient's serum was due to an alloantibody.

Another sample from this patient was submitted on 03/19/2014. The warm autoantibody was still reactive, with no auto-anti-e specificity detected.



IMMUNOHEMATOLOGY STUDIES

Name	Ref #	ID Number	Date of Specimen	Date Tested	Tech
L. H.	XX-14	12345	02192014	02192014	CB

Other testing:

	DAT	Eluate	R_2R_2 ads Serum
	IgG	IgG	PEG IgG
EGA-Treated Auto cells	0✓	+^m	1+

Case study 2

This sample was from an African American sickle cell patient collected 12/28/2013. He had been transfused in 2011, but had no recent transfusions.

The patient was B Positive, D+,C-,E+,c+,e+; M+,N+,S-,s+; K-; Fy(a-b-); Jk(a+b-); Le(a-b+), P1+

IMMUNOHEMATOLOGY STUDIES

Name: A.M.	Ref #: XX-13	Date of Specimen: 12282013 ☐ Plasma	☐ Pretransfusion Sample ☐ Post Transfusion Sample	
ID Number: 45678		Facility: Hospital		
Last Transfused on: 2011	Date Started: 12282013	Tech: TER	WID: 1 2 3 4 5 (6) 7 8 ☐ 011.1642 ☐ 011.1414 ☐ 011.6233	

	Cell Typings												Serum Grouping						DAT				
	A	B	A,B	H	D	Rh Ct	C	E	c	e	Ct*	Weak D: D	Weak D: Rh Ct	O	Auto	A_1	A_2	B		Poly	IgG	c'	Sal Ct
IS	0	4+	4+		4+	0										4+	3+	0	IS	0		NA	
5' RT							0	3+	4+	3+	0								5' RT	0v	NA		

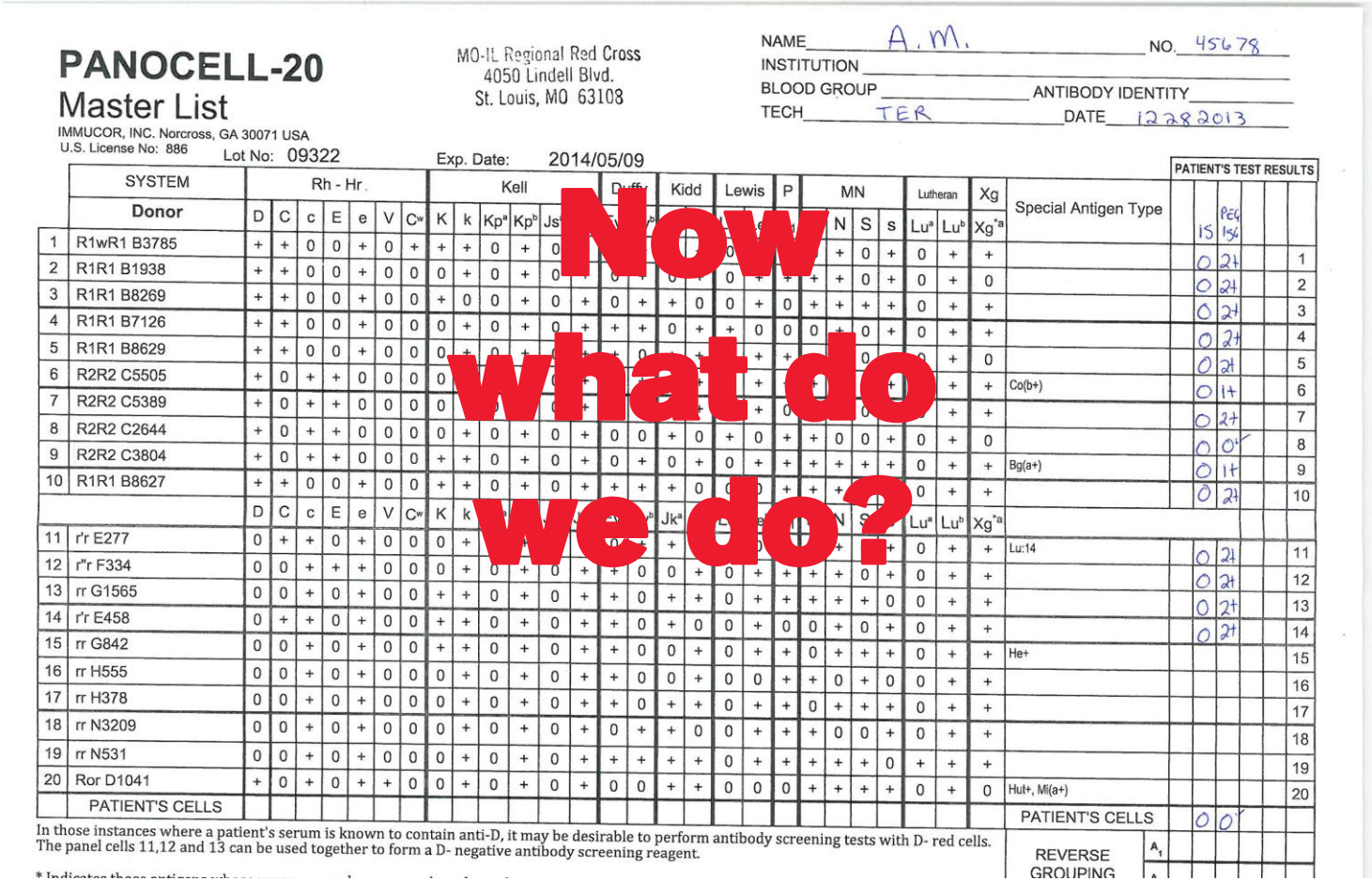
* Ct = Rh phenotype control, use only when required by manufacturer's instructions

Cell Treatments: EGA = EDTA Glycine-Acid; CDP=Chloroquine Diphosphate

	Other Antigens:	M	N	S	s	K	Fy^a	Fy^b	Jk^a	Jk^b	Le^a	Le^b	P_1			
Result	Neat	3+	3+	0v	2+	0	0v	0v	2+	0v	0	3+	3+			
	Cell Sep.															
Cell treatment		☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP
Manufacturer Lot Number Expiration																

Initial panel

All cells but one were reactive with the initial panel at PEG-IgG. The results showed some variability in the strength of reaction.



PANOCELL-20
Master List
IMMUCOR, INC. Norcross, GA 30071 USA
U.S. License No: 886 Lot No: 09322 Exp. Date: 2014/05/09

MO-IL Regional Red Cross
4050 Lindell Blvd.
St. Louis, MO 63108

NAME A.M. NO. 45678
INSTITUTION
BLOOD GROUP ANTIBODY IDENTITY
TECH TER DATE 12282013

	SYSTEM	Rh - Hr							Kell					Duffy		Kidd		Lewis		P	MN			Lutheran		Xg	Special Antigen Type	PATIENT'S TEST RESULTS				
	Donor	D	C	c	E	e	V	Cʷ	K	k	Kpᵃ	Kpᵇ	Jsᵃ								N	S	s	Luᵃ	Luᵇ	Xgᵃ		15	PEG 15'			
1	R1wR1 B3785	+	+	0	0	+	0	+	+	+	0	+	0								+	0	+	0	+	+						1
2	R1R1 B1938	+	+	0	0	+	0	0	0	+	0	+	0								+	0	+	0	+	0			2+			2
3	R1R1 B8269	+	+	0	0	+	0	0	+	0	0	+	0	+	0	+	+	0	+	0	+	+	+	0	+	0			2+			3
4	R1R1 B7126	+	+	0	0	+	0	0	0	+	0	+	0	+	+	0	+	+	0	0	0	+	0	+	0	+	+			2+			4
5	R1R1 B8629	+	+	0	0	+	0	0	0	+	0	+	0	+	+	0	+	+	0	0	+	+	0	+	0	+	0			2+			5
6	R2R2 C5505	+	0	+	+	0	0	0	0	+	0	+	0	+	+	0	+	+	0	0	+	+	0	+	0	+	+	Co(b+)		1+			6
7	R2R2 C5389	+	0	+	+	0	0	0	0	+	0	+	0	+	+	0	+	+	0	0	+	+	0	+	0	+	+			2+			7
8	R2R2 C2644	+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	0	+	0	+	0			0'			8
9	R2R2 C3804	+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	+	+	+	0	+	+	Bg(a+)		1+			9
10	R1R1 B8627	+	+	0	0	+	0	0	+	+	0	+	0	+	+	+	0	+	0	+	+	+	+	+	0	+	+			2+			10
		D	C	c	E	e	V	Cʷ	K	k			Jkᵃ								N	S		Luᵃ	Luᵇ	Xgᵃ						
11	r'r E277	0	+	+	0	+	0	0	0	+											+	+	+	0	+	+	Lu:14		2+			11
12	rʷr F334	0	0	+	+	+	0	0	0	+	0	+	0	+	0	0	+	0	+	+	+	+	0	+	0	+	+			2+			12
13	rr G1565	0	0	+	0	+	0	0	+	+	0	+	0	+	+	0	+	+	+	+	+	+	0	0	+	+			2+			13
14	r'r E458	0	+	+	0	+	0	0	+	+	0	+	0	+	+	0	+	0	+	0	0	+	0	+	0	+	+			2+			14
15	rr G842	0	0	+	0	+	0	0	+	+	0	+	0	+	0	0	+	0	+	+	0	+	+	+	0	+	+	He+					15
16	rr H555	0	0	+	0	+	0	0	0	+	0	+	0	+	0	0	+	0	0	+	+	0	+	0	0	+	+						16
17	rr H378	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	+	+						17
18	rr N3209	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	0	0	+	0	+	+						18
19	rr N531	0	0	+	0	+	0	0	0	+	0	+	0	+	+	+	+	+	0	+	+	+	+	+	0	+	+	+						19
20	Ror D1041	+	0	+	0	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	0	+	+	+	+	0	+	0	Hut+, Mi(a+)					20
	PATIENT'S CELLS																										PATIENT'S CELLS		0	0'		
	REVERSE GROUPING	A_1																														

In those instances where a patient's serum is known to contain anti-D, it may be desirable to perform antibody screening tests with D- red cells. The panel cells 11,12 and 13 can be used together to form a D- negative antibody screening reagent.

Now what do we do?

Phenotypically similar selected cells

Often when we are puzzled, we will test cells that are phenotypically similar to the patient. These can show us whether we are looking at multiple antibodies or a high prevalence antibody.

In this case, two cells were positive and one was negative. We've now noticed that both our negative cells are R2R2.

Patient's Name A.M.
Patient's Number 45678
Date: Collected 12282013 Date: Tested 12282013

SELECTED PANEL 6:31 pm, 4/16/2014
American Red Cross, Missouri-Illinois Region
4050 Lindell, St. Louis, MO 63108
Technologist: TER

	Supplier Lot #	Donor/ Vial#	RhHr							MN				P	Lew		Lut		Kell						Duf		Kid		X	Additional Antigens	Patient's Plasma Test Results						
			D	C	E	c	e	f	V	Cw	M	N	S	s	P1	Lea	Leb	Lua	Lub	K	k	Kpa	Kpb	Jsa	Jsb	Fya	Fyb	Jka	Jkb	Xga		PEG IgG					
1	Ortho A RA976	312351 4	+	0	0	+	+	+	+	0	+	0	0	+	+	0	0	0	+	0	+	0	+		+	0	0	+	0	+	Bg-	2+					
2	Ortho A RA976	310921 9	0	0	0	+	+	+	0	0	0	+	0	+	+	+	0	0	+	0	+	0	+		+	0	+	+	0	+	Bg+	2+					
3	Imm-20 06275	C1498 8	+	0	+	+	0		0	0	0	+	0	+	+	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	Bg(a-)	0					
	Patient's Phenotype		+	0	+	+	+				+	+	0	+	+	0	+			0						0	0	+	0							

Additional e- selected cells

We test additional e- cells which are positive for antigens which our patient's cells lack. What we find is a pattern of anti-Fy^{a} and anti-Jk^{b}.

Patient's Name A. M.
Patient's Number 45678
Date: Collected 12282013 Date: Tested 12282013

SELECTED PANEL 6:37 pm, 4/16/2014
American Red Cross, Missouri-Illinois Region
4050 Lindell, St. Louis, MO 63108
Technologist: TER

	Supplier Lot #	Donor/ Vial#	RhHr								MN				P	Lew		Lut		Kell						Duf		Kid		X	Additional Antigens	Patient's Plasma Test Results
			D	C	E	c	e	f	V	Cw	M	N	S	s	P1	Lea	Leb	Lua	Lub	K	k	Kpa	Kpb	Jsa	Jsb	Fya	Fyb	Jka	Jkb	Xga		PEG ISG
1 OOD	Ortho A RA973	111040 3	+	0	+	+	0	0	0	0	+	0	+	0	s	0	0	0	+	0	+	0	+	0	+	0	+	+	0	0	Bg+	0
2	Ortho B RB390	306782 16	+	0	+	+	0	0	0	0	0	+	0	+	+	0	+	0	+	0	+	0	+	0	+	+	+	+	0	+	Bg+	1+
3	Imm-10F 10323	C3723 3	+	0	+	+	0		0	0	+	0	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	+	+	+	Bg(a-) U-	Wt
4 OOD	Imm-16 27446	C4684 3	+	0	+	+	0		0	0	0	+	0	+	+	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	Bg(a-)	0
5 OOD	Imm-20 03225	C3474 6	+	0	+	+	0		0	0	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	+	0	0	Bg(a-)	0

Confirmation of alloantibodies

Additional cells confirm the presence of anti-Fy^{a}, and anti-Jk^{b} in the patient's serum along with the anti-e-like antibody.

Patient's Name A.M.
Patient's Number 45678
Date: Collected 12282013 Date: Tested 12282013

SELECTED PANEL 6:44 pm, 4/16/2014
American Red Cross, Missouri-Illinois Region
4050 Lindell, St. Louis, MO 63108
Technologist: TER

	Supplier Lot #	Donor/ Vial#	RhHr								MN				P	Lew		Lut		Kell						Duf		Kid		X	Additional Antigens	Patient's Plasma Test Results					
			D	C	E	c	e	f	V	C w	M	N	S	s	P 1	Le a	Le b	Lu a	Lu b	K	k	Kp a	Kp b	Js a	Js b	Fy a	Fy b	Jk a	Jk b	Xg a		PEG 15%					
1	Ortho A RA975	313663 3	+	0	+	+	0	0	0	0	+	0	0	+	0	0	+	0	+	0	+	0	+		+	0	+	0	+	+	Bg-	1+					
2	Ortho B RB390	312263 15	+	0	+	+	0	0	0	0	+	0	+	+	+	0	+	+	+	0	+	0	+		+	0	+	0	+	+	Bg-	1+					
3	Imm-Pano 07292	C589 2	+	0	+	+	0		0	0	+	0	+	+	+	+	0	0	+	0	+	0	+	0	+	+	0	+	0	+			2+					
4 OOD	Imm-20 03225	C4362 9	+	0	+	+	0		0	0	+	+	+	+	+	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	Bg(a-)		2+					

Is this anti-hr^{B} or anti-hr^{S}?

We know the patient is e+ with an anti-e-like antibody which does not react with his own red cells.

We have several examples of anti-hr^{B} frozen, so we use them to type the patient's red cells. Unfortunately we do not have any ABO compatible anti-hr^{S}.

IMMUNOHEMATOLOGY STUDIES

Name: A. M.											Ref #: XX-13		Date of Specimen: 12282013 ☐ Plasma				☐ Pretransfusion Sample ☐ Post Transfusion Sample							
ID Number: 45678													Facility: Hospital											
Last Transfused on: 2011					Date Started: 12282013								Tech: TER				WID: 1 2 3 4 5 (6) 7 8 ☐ 011.1642 ☐ 011.1414 ☐ 011.6233							
	Cell Typings												Serum Grouping					DAT						
	A	B	A,B	H	D	Rh Ct	C	E	c	e	Ct*	Weak D: D	Weak D: Rh Ct	O	Auto	A_1	A_2	B		Poly	IgG	c'	Sal Ct	
IS																			IS			NA		
5' RT																			5' RT		NA			

* Ct = Rh phenotype control, use only when required by manufacturer's instructions Cell Treatments: EGA = EDTA Glycine-Acid; CDP=Chloroquine Diphosphate

Other Antigens:		hr^B	hr^B	hr^B													
Result	Neat	1+	w+	2+													
	Cell Sep.																
Cell treatment		☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP	☐ EGA ☐ CDP
Manufacturer Lot Number Expiration		sample 1	sample 2	sample 3													

Manufacturers: I = Immucor; O = Ortho; A = American Red Cross (in house or Diagnostic Manufacturing Division); B = Biorad; Q = Alba Bioscience/Quotient

	Routine							Eluate		Last Wash		Crossmatching:						
	15'	15'	IS	LISS	LISS	PEG	GEL	IgG	PEG	IgG	PEG							

Selected rare cells

We have some cells frozen which have been characterized as hr^S negative, so we tested them against the patient's serum. These e+, hr^S- cells are nonreactive. Can we go ahead and call this anti-hr^S?

PATIENT: A.M.

ID NUMBER: 45678

DATE: 12282013

TECH: TER

SELECTED CELLS

Not Yet!

	D	C	E	c	e	f	C^w	V	M	N	S	s	Lu^a	Lu^b	P^1	Le^a	Le^b	K	k	Kp^a	Js^a	Fy^a	Fy^b	Jk^a	Jk^b			PEG 15%
1053A hrS-	w+	0	0	+	+	+	0		+	0	0	+				0	+	0				0	0	+	0			0 ✓
144C hrS-	+	+	+	+	+				0	+	0	+						0				0	0	+	0			0 ✓

Molecular Confirmation and Transfusion Recommendations

- The patient's cells were submitted for molecular characterization of the e antigen. The cells were confirmed as hr^S- and the exact molecular variation of the patient's antigen was determined.

- If you recall our patient's phenotype, they were E+. We were unable to rule out anti-K, so we recommended the transfusion of e-, K-, Fy(a-), Jk(b-) units. Of course these are still quite rare, but not as hard to find as E-, hr^S- units.

Conclusions

Generally when a patient has an autoantibody, we don't recommend antigen negative units for transfusion, as this may immunize them to the alternate antigen. In the case of an apparent auto-anti-e, patient history including race needs to be strongly considered. Additional testing must be performed to show whether the specificity is autoantibody or alloantibody.

Conclusions

Patients with e-like alloantibodies who type e+ should be tested molecularly to characterize their e antigen. This is particularly important for E- patients who may become immunized to both E and e.

Conclusions

It is always best to avoid transfusion if you have a patient with anti-e-like antibody. In an emergency, transfusion of e+ red blood cells may be necessary.

Questions