ABID CASE #27
(Case study by Jim Perkins, © 2009)

Indian Immunohematology Initiative

History: This patient was a 36 year-old woman with a stage 4 gastro-intestinal stromal tumor (GIST) who was taking an experimental drug. On a routine clinic visit a hemoglobin of 8.5 was noted, and a type-and-screen was ordered. She had received 36 units of RBCs over the previous 3 years including 21 units in the year in which the workup was done, most recently 45 days ago, at which time the antibody screen was negative.

ABO and Rh Typing

<A	<B	A1 cells	B cells	6% alb	<D	<D/AHG	CCC	Interp
0	0	4+	4+		4+			

Antibody Screen

	Gel
SCI	2+
SCII	2+

Direct Antiglobulin Test (tube method)

	Poly	IgG	<C3
AHG	0		
5' incub.	0		
CCC	2+		

Initial Plasma Panel

Lot# 8RA167		Rh system						Kell						Duffy		Kidd		Xg	Lewis		MNSs				P	Lutheran		Other Typings		
Cell	Rh	D	C	E	c	e	V	K	k	Kp^a	Kp^b	Js^a	Js^b	Fy^a	Fy^b	Jk^a	Jk^b	Xg^a	Le^a	Le^b	S	s	M	N	P1	Lu^a	Lu^b		Cell	Gel
1	R1wR1	+	+	0	0	+	0	0	+	0	+	0	+	+	0	+	0	0	0	+	0	+	0	+	+s	0	+	C^w	1	0
2	R1R1	+	+	0	0	+	0	0	0	0	+	0	+	+	+	0	+	+	0	+	+	0	+	0	+	0	+		2	2+
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	+	+	0	+	0	+	0	+		3	w+
4	Ror	+	0	0	+	+	0	0	+	0	+	0	+	0	0	+	0	0	0	0	0	+	+	0	+s	0	+		4	2+
5	r'r	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	0	0	+	0	+	+	0	+		5	0
6	r"r	0	0	+	+	+	0	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	+	+	0	+		6	1+
7	rr	0	0	0	+	+	0	+	+	0	+	0	+	0	+	+	+	+	0	0	+	+	0	+	+	0	+		7	2+
8	rr	0	0	0	+	+	0	0	+	+	+	0	+	+	+	+	+	+	0	+	0	+	+	+	0	+	+		8	w+
9	rr	0	0	0	+	+	0	0	+	0	+	0	+	+	0	0	+	+	+	0	0	+	0	+	+	0	+		9	2+
10	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	0	+	0	+	+	0	+	0	0	0	+		10	w+
11	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	0	+	+	+	+	0	+	0	+	0	+	0	0	+		11	w+
Patient																													AC	

Extended Phenotype

	Rh system				Kell				Kidd		Duffy		Lewis		MNSs								
	C	E	c	e*	K	k	Kp^a	Js^a	Fy^a	Fy^b	Jk^a	Jk^b	Le^a	Le^b	S	s	M	N	P1	I	H	A_1	
Patient	mf	3+	3+	3+	0				3+	3+	3+	3+	0	4+	3+	3+	4+	4+	4+				

*Patient RBCs are not phenotyped for e if the E antigen is not expressed.

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Questions:

1. What can you say about this problem so far? What possibilities should we consider? What additional testing might you do at this point?

The technologist tested RBCs selected to rule out antibody specificities suggested by the first panel, as well as testing multiple cells from an extended panel by the saline tube method.

Selected cell panel

Lot# 8RB165		Rh system						Kell						Duffy		Kidd		Xg	Lewis		MNSs				P	Lutheran		Other Typings		Plasma
Cell	Rh	D	C	E	c	e	V	K	k	Kp^a	Kp^b	Js^a	Js^b	Fy^a	Fy^b	Jk^a	Jk^b	Xg^a	Le^a	Le^b	S	s	M	N	P1	Lu^a	Lu^b		Cell	Gel
12	rr	0	0	0	+	+	0	0	+	0	+	0	+	+	0	0	+	+	0	+	+	+	0	+	+	0	+		12	2+
15	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	0	+		15	2+
16	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	0	+		16	w+
22	R1R1	+	+	0	0	+	0	+	0	0	+	0	+	+	+	+	+	+	0	+	0	+	0	+	+s	0	+		22	2+

Saline/tube panel ("√" indicates that Coombs' control cells reacted)

		Rh system						MNSs				P	Lewis		Lutheran		Kell				Duffy		Kidd							
Cell	Rh	D	C	E	c	e	V	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	Xg^a		Cell	IS	37°	IgG
1	R1wR1	+	+	0	0	+	/	+	+	0	+	0	0	+	0	+	0	+	0	0	0	+	+	+	/		1	0	0	0√
2	R1R1	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	0	+	0	+	0	+		2	0	0	w+
11	r'r	0	+	0	+	+	/	0	+	+	+	+	0	0	+	+	0	+	0	0	+	0	0	+	+		11	0	0	vw+
12	r"r	0	0	+	+	+	/	+	+	0	+	+	0	+	+	+	0	+	0	0	0	+	+	+	+		12	0	0	vw+
13	rr	0	0	0	+	+	/	+	+	0	+	+	+	0	0	+	+	+	0	0	+	+	0	+	+		13	0	0	vw+
14	rr	0	0	0	+	+	/	0	+	0	+	0	0	+	0	+	0	+	0	0	+	+	+	0	/		14	0	0	vw+
15	rr	0	0	0	+	+	/	+	+	+	0	0	+	0	0	+	0	+	0	0	0	+	+	0	+		15	0	0	vw+
16	rr	0	0	0	+	+	/	+	0	+	+	+	0	+	0	+	0	+	0	0	+	0	0	+	0		16	0	0	vw+
17	rr	0	0	0	+	+	0	+	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	+	/		17	0	0	0√
18	rr	0	0	0	+	+	/	+	+	0	+	+	0	0	0	+	0	+	0	0	0	+	+	+	+	C^w	18	0	0	vw+
19	rr	0	0	0	+	+	0	+	0	+	+	+	0	+	0	+	0	+	0	0	+	0	+	0	+		19	0	0	0√
20	Ro	+	0	0	+	+	0	+	+	+	+	+	0	+	0	+	0	+	0	0	0	0	+	+	+		20	0	0	0√
Patient																														

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Questions:

2. Did the additional testing help? Can you form a new hypothesis that will lead to further investigation?

The technologist tested 3% (tube method) screening cells using LISS and PEG enhancement, and again after treating the screening cells with ficin and AET. They also tested dilutions of the plasma against screening cell II, which had the detectable reactions. (See reactions below)

Special tests (AET = 2-Aminoethylisothiouronium, a sulfhydryl reducing againt)

	LISS				PEG	Ficin treated RBCs			AET treated RBCs			
	IS	RT	37°, 30'	AHG	AHG	IS	37°, 30'	AHG	IS	37°, 30'	AHG	anti-k*
SCI	0	0	0	0$^{\surd}$	0$^{\surd}$	0	1+	0$^{\surd}$	1+	0	0$^{\surd}$	0$^{\surd}$
SCII	0	0	0	vw+	vw+	0	1+	0$^{\surd}$	1+	0	vw+	
Auto	0	0	0	0$^{\surd}$		0	1+	0$^{\surd}$				

*AET control

Titration

	2 drops diluted pt. plasma, 1 drop saline-susp. RBCs, read at AHG phase							
	1:1	1:2	1:4	1:8	1:16	1:32	1:64	Titre
SCII	w+	w+	vw+	vw+	vw+	vw+	0$^{\surd}$	2

Questions:

3. What do the new test results show? How was the AET control performed and what did it demonstrate? How might we proceed now?

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The technologist performed a plasma neutralization test with the following results:

Plasma neutralization test

Pt. plasma diluted as above and incubated 1:1 with pooled normal plasma, read at AHG								Titer
SCII	$0^{\surd}$	$0^{\surd}$	$0^{\surd}$	$0^{\surd}$	$0^{\surd}$	$0^{\surd}$	$0^{\surd}$	0
Dilution control (Saline substituted for pooled normal plasma)								
SCII	w+	w+	vw+	vw+	$0^{\surd}$	$0^{\surd}$	$0^{\surd}$	2

4. What does the plasma neutralization test demonstrate? What is the identity of this antibody? Why must a dilution control be done?

5. Would donor RBCs reactive with this antibody cause hemolytic transfusion reactions? Has any other type of reaction been associated with this antibody specificity? What do we know about the Ch/Rg antigen(s)?