

### HDFN TECHNICAL CASE #3

Case study by Jim Perkins, M.D. (©2009)

**History:** The patient is a 33 year old pregnant woman of Philippine ethnic origin referred to a maternal-fetal medicine specialist because of a positive antibody screen on prenatal testing. Repeat testing was ordered to confirm the other laboratory's results.

#### ABO and Rh Typing

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

#### Antibody Screen

	Gel
SCI	(see panel)
SCII	

#### Direct Antiglobulin Test (tube method)

	Poly	IgG	<C3
AHG	0		
CCC	2+		

#### Initial Panel

Lot #: 8RA181	Rh system	Kell				Duffy		Kidd		Xg	Lewis		MNSs				P	Lutheran		Other Typings	Cell	Gel											
Cell	Rh	D	C	E	c	e	V	K	k	Kp <sup>a</sup>	Kp <sup>b</sup>	Js <sup>a</sup>	Js <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	Xg <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	Lu <sup>a</sup>	Lu <sup>b</sup>						
1	R1wR1	+	+	0	0	+	0	+	+	0	+	0	+	+	0	+	+	0	0	+	0	+	+	0	+	+	0	+	0	+	C <sup>w</sup>	1	3+
2	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	+	0	+	0	+	0	0	0	+	0	+	+	+	+	0	+		2	3+	
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	+	+	0	+	0	0	0	+	0	+	+	+	+	+	+		3	3+	
4	Ror	+	0	0	+	+	0	0	+	0	+	0	+	+	0	+	0	+	0	+	+	0	+	0	0	0	0	+		4	3+		
5	r'r	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	+	+	+	0	+	+	+	+	+	+	0	+		5	3+		
6	r''r	0	0	+	+	+	0	0	+	+	+	0	+	0	+	+	+	+	0	+	+	+	+	+	+	+	0	+		6	3+		
7	rr	0	0	0	+	+	+	+	+	0	+	0	+	0	+	0	+	+	0	+	0	+	+	+	+	+	0	+		7	3+		
8	rr	0	0	0	+	+	0	0	+	0	+	0	+	+	0	+	0	0	+	0	0	+	0	+	+	+	0	+		8	3+		
9	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	0	+	+	+	+	+	+		9	3+		
10	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	+	0	0	0	0	+		10	3+		
11	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	+		11	3+		
Patient																														AC			

#### Antigen Phenotype

	Rh system				Kell				Duffy		Kidd		Lewis		MNSs							
	C	E	c	e	K	k	Kp <sup>a</sup>	Js <sup>a</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	I	H	A <sub>1</sub>
Patient	4+	4+	4+	4+	0				2+	0	0	0			1+	2+	0	3+				
Pos control	4+	4+	3+	3+	2+				2+	2+	2+	3+			3+	3+	2+	2+				
Neg Control	0	0	0	0	0				0	0	0	0			0	0	0	0				

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**Antigen Phenotype**

	Rh system				Kell				Duffy		Kidd		Lewis		MNSs							
	C	E	c	e	K	k	Kp <sup>a</sup>	Js <sup>a</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	PI	I	H	A <sub>1</sub>
Patient	4+	4+	4+	4+	0				2+	0	0	0			1+	2+	0	3+				
Pos control	4+	4+	3+	3+	2+				2+	2+	2+	3+			3+	3+	2+	2+				
Neg Control	0	0	0	0	0				0	0	0	0			0	0	0	0				

**Additional Panels:** LISS panel with raw plasma and plasma alloadsorbed x3 on a ficin-treated, Jk(a+,b+), K neg, group O RBC, and diluted 2:1

Lot #08068		Rh system				Kell						Duffy		Kidd		Lewis		P	MNSs					Lutheran		Xg	Other Typings	LISS				Alloads plasma
Cell	Rh	D	C	c	E	e	K	k	Kp <sup>a</sup>	Kp <sup>b</sup>	Js <sup>a</sup>	Js <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	Le <sup>a</sup>	Le <sup>b</sup>	PI	M	N	S	s	Lu <sup>a</sup>	Lu <sup>b</sup>	Xg <sup>a</sup>		Cell	IS	37 <sup>o</sup>	AHG	Gel
1	RzR1	+	+	0	+	+	0	+	0	+	0	+	+	+	0	+	0	+	0	+	+	0	+	0	+	+	0	1	0	0	3+	0 <sup>v</sup>
2	R1wR1	+	+	0	0	+	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	+	0	+	+	0	2	0	0	3+	0 <sup>v</sup>
3	R2R2	+	0	+	+	0	+	+	0	+	0	+	0	+	+	0	0	+	0	+	0	+	0	0	+	+	0	3	0	0	3+	0 <sup>v</sup>
4	Ror	+	0	+	0	+	0	+	0	+	0	+	0	0	+	0	0	+	+	+	0	0	0	0	+	+	Go <sup>a+</sup>	4	0	0	3+	0 <sup>v</sup>
5	r'r	0	+	+	0	+	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	0	+	0	+	+	5	0	0	3+	0 <sup>v</sup>	
6	r''r	0	0	+	+	+	0	+	0	+	0	+	+	0	0	+	0	+	+	+	+	0	+	0	+	+	6	0	0	3+	0 <sup>v</sup>	
7	rr	0	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	+	Bg <sup>a+</sup>	7	0	0	3+	0 <sup>v</sup>
8	rr	0	0	+	0	+	0	+	0	+	0	+	+	0	+	0	0	0	+	+	0	0	+	0	+	+	8	0	0	3+	0 <sup>v</sup>	
9	rr	0	0	+	0	+	0	+	0	0	+	+	0	+	+	+	0	0	0	+	0	0	+	0	+	+	9	0	0	3+	0 <sup>v</sup>	
10	rr	0	0	+	0	+	0	+	0	+	0	+	+	0	+	0	0	+	+	+	0	0	+	0	+	+	10	0	0	3+	0 <sup>v</sup>	
11	R1R1	+	+	0	0	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	+	0	+	0	+	+	I-,Yt <sup>b+</sup>	11	0	0	3+	0 <sup>v</sup>
Patient																											AC	0	0	0 <sup>v</sup>	0 <sup>v</sup>	

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**Questions:**

1. What is the probable identity of this antibody? What is the relevance of the patient's ethnic origin?
  
2. Is any further workup needed to prove it? What does the alloadsorption study demonstrate?
  
3. Does this antibody cause hemolytic transfusion reactions (HTRs)? HDFN?
  
4. How might we find compatible blood for this patient?
  
5. What is the possible genetic basis of this patient's phenotype?
  
6. What is the biochemical nature of the antigen? Are there any health consequences of this phenotype?