

**ABID CASE #30, ANSWERS**

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



1. What is the identity of this antibody? Is it proven? Which reaction is anomalous? How might you explain this reaction?

*The patient has alloanti-f (anti-ce) which is proven by our laboratory's criteria (3 antigen positive cells reactive, 3 antigen negative cells nonreactive, other common antibody specificities ruled out, patient lacks the corresponding antigen).*

*The reaction with cell #2 (R2R2) in the initial antibody screen does not fit this diagnosis, and may be due to a concomitant antibody directed against a low frequency antigen, possibly an HLA antigen. Absent this antibody the anti-f in this case would have gone undetected. Since the typical screening cell duet used in the United States does not include an f-positive (rr) cell, anti-f in the absence of another antibody is a potential cause of an HTR after a negative antibody screen if only an abbreviated (no Coombs phase reaction) crossmatch is used when the screen is non-reactive.*

2. Does this antibody cause hemolytic transfusion reactions? Hemolytic disease of the fetus and newborn?

*Like other Rh blood group system antibodies, anti-f has been reported to cause mild HTRs and HDFN.*

3. What is the titer in this case? (Hint: what would the titer be if the LISS IAT were used to determine the titer of antibodies.) How would you follow this pregnancy?

*Based on the negative reaction in the LISS-IAT with double dose f positive RBCs the titer is <1. That is, the antibody is detectable so the titer is not zero, but it does not react by the titer method so it is not 1.*

*Our laboratory would follow the patient's titer beginning at 20 weeks. It might be useful to determine the father's Rh phenotype to determine he could have an f-positive child, particularly if he was not the father of one of the previous pregnancies. If he was the father of all four pregnancies however, we would assume that he is the source of the f gene that led to her immunization.*

4. What is the biochemistry of this antigen? Show the reactions you would expect for the antibodies anti-Ce and anti-cE in the following panel.

*"f" ("RH6") is an antigen in the Rh system that is formed when a c-determinant and an e-determinant are present on the same CE allele in so-called "cis position", so that the c and e amino acid sequences are present on the same CE protein molecules. Thus it is termed a "compound antigen" and is directed by r and Ro alleles. One would expect all of the combinations of C/c and E/e to determinants to occur, and, indeed anti-Ce ("RH7"), anti-cE ("RH27"), and anti-CE ("RH22") have all been described.*

Lot#	Rh system	Kell						Duffy		Kidd		Lewis		MNSs				P	>cE	>Ce							
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>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	Cell	AHG	AHG
1	R1wR1	+	+	0	0	+	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	+	0	1	0	+
2	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	+	+	+	+	0	0	+	0	+	0	+	2	0	+
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	+	+	+	+	+	3	+	0
4	Ror	+	0	0	+	+	+	0	+	0	+	0	+	0	0	+	0	+	0	0	+	0	+	+	4	0	0
5	r'r	0	+	0	+	+	0	0	+	0	+	0	+	+	0	0	+	0	+	0	+	+	+	+	5	0	+
6	r''r	0	0	+	+	+	0	0	+	0	+	0	+	+	0	0	+	0	+	+	+	+	+	+	6	+	0
7	rr	0	0	0	+	+	0	+	+	0	+	0	+	0	+	+	+	0	+	0	+	+	+	0	7	0	0
8	rr	0	0	0	+	+	0	0	+	0	+	0	+	+	0	+	0	+	0	+	+	+	+	+	8	0	0
9	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	+	9	0	0
10	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	+	10	0	0
11	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	0	+	+	+	0	+	0	+	0	+	+	11	0	+
Patient																									AC	0	0