



THE UNIVERSITY OF TEXAS HEALTH SYSTEM

Just When You Thought It Was Safe to Go Back to the Water – A Case Report

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Objectives

- Describe workflows that can be used when dealing with unidentified reactivity.
- Discuss transfusion recommendations when dealing with unidentified reactivity.

A Case of the Unexpected

- So first, we must go back in time...
- Back to 2001: 11.27.2001 Jk^a, K
- Speed up to 2015
 - 71 year-old female
 - ABO/Rh: O Positive
 - Hx: anti-K, anti-Jka

	Rh					MNSs				Kell		Duffy		Kidd		Results
	D	C	E	c	e	M	N	S	s	K	k	Fy a	Fy b	Jk a	Jk b	SPRCA
1	+	+	0	0	+	+	+	0	+	+	+	0	+	+	0	4+
2	+	0	+	+	0	+	0	0	+	0	+	+	0	0	+	3+
3	0	0	0	+	+	0	+	+	+	+	+	0	+	+	+	4+

A Case of the Unexpected

		Rh					Kell				Duffy		Kidd		Lewis		MNS				SPRCA	
		D	C	E	c	e	K	k			Kp ^a	Kp ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Lu ^a	Lu ^b	M	N		S
1	R ₂ R ₂	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	0	+	0	0	+	4+
2	r'r	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	4+	
3	R ₁ R ₁	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	2+	
4	rr	0	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	4+	
5	R ₁ R ₁	+	+	0	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	4+	
6	R ₂ R ₂	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	0	+	0	+	4+	
7	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	3+	
8	rr	0	0	0	+	+	+	0	0	+	+	+	0	+	0	+	0	+	+	0	3+	
9	rr	0	0	0	+	+	0	+	+	+	0	+	0	+	0	+	0	+	+	0	2+	

A Case of the Unexpected

- Sample sent to CBC-IRL

		Rh					Kell				Duffy		Kidd		Lewis		MNS				PEG IAT
		D	C	E	c	e	K	k			Kp ^a	Kp ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Lu ^a	Lu ^b	M	N	
1	R ₂ R ₂	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	0	+	0	+	Pos
2	r'r	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	Pos
3	R ₁ R ₁	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	Pos
4	rr	0	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	Pos
5	R ₁ R ₁	+	+	0	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	Pos
6	R ₂ R ₂	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	0	+	0	+	Pos
7	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	Pos
8	rr	0	0	0	+	+	+	0	0	+	+	+	0	+	0	+	0	+	+	0	Pos
9	rr	0	0	0	+	+	0	+	+	+	0	+	0	+	0	+	0	+	+	0	Pos

A Case of the Unexpected

- Sample sent to CBC-IRL

		Rh					Kell		Kp ^a	Kp ^b	Duffy		Kidd		Lewis		MNS				Ficin Treated
		D	C	E	c	e	K	k			Fy ^a	Fy ^b	Jk ^a	Jk ^b	Lu ^a	Lu ^b	M	N	S	s	
1	R ₂ R ₂	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	0	+	0	+	Pos
2	r'r	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	Pos
3	R ₁ R ₁	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	Pos
4	rr	0	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	Pos
5	R ₁ R ₁	+	+	0	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	Pos
6	R ₂ R ₂	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	0	+	0	+	Pos
7	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	Pos
8	rr	0	0	0	+	+	+	0	0	+	+	+	0	+	0	+	0	+	+	0	Pos
9	rr	0	0	0	+	+	0	+	+	+	0	+	0	+	0	+	0	+	+	0	Pos

		Rh					Kell		Kp ^a	Kp ^b	Duffy		Kidd		Lewis		MNS				DTT
		D	C	E	c	e	K	k			Fy ^a	Fy ^b	Jk ^a	Jk ^b	Lu ^a	Lu ^b	M	N	S	s	
1	R ₂ R ₂	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	0	+	0	+	Weak Pos
2	r'r	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	Weak Pos
3	R ₁ R ₁	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	Weak Pos
4	rr	0	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	Weak Pos
5	R ₁ R ₁	+	+	0	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	Weak Pos
6	R ₂ R ₂	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	0	+	0	+	Weak Pos
7	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	Weak Pos
8	rr	0	0	0	+	+	+	0	0	+	+	+	0	+	0	+	0	+	+	0	Weak Pos
9	rr	0	0	0	+	+	0	+	+	+	0	+	0	+	0	+	0	+	+	0	Weak Pos

A Case of the Unexpected

- Rare cells tested

Rare Cells	PEG IAT
Tj(a-)	Pos
K ⁰	Pos
Kn -	Pos
Lan -	Pos
Sc:-3	Pos
Anwj -	Pos
Lu (a-b-)	Pos
Di(b-)	Pos
Yt(a-)	Pos
Vel-	Pos
JMH-	Pos

A Case of the Unexpected

- Phenotype: C+, E+ c+ e+; K-; Fy(a+b+); Jk(a-b+); M-, N+, S-, s+; Lu(b+)
- At this time the reactivity is unidentified and clinical significance is unknown
- Recommend phenotypically matched RBCs and close monitoring of the patient – patient received 2 RBCs prior to workup completion

A Case of the Unexpected - ish

- Patient arrives 2024

	Rh					MNSs				Kell		Duffy		Kidd		Results
	D	C	E	c	e	M	N	S	s	K	k	Fy a	Fy b	Jk a	Jk b	SPRCA
1	+	+	0	0	+	+	+	0	+	+	+	0	+	+	0	3+
2	+	0	+	+	0	+	0	0	+	0	+	+	0	0	+	3+
3	0	0	0	+	+	0	+	+	+	+	+	0	+	+	+	4+

- No real surprises but no real answers

A Case of the Unexpected - ish

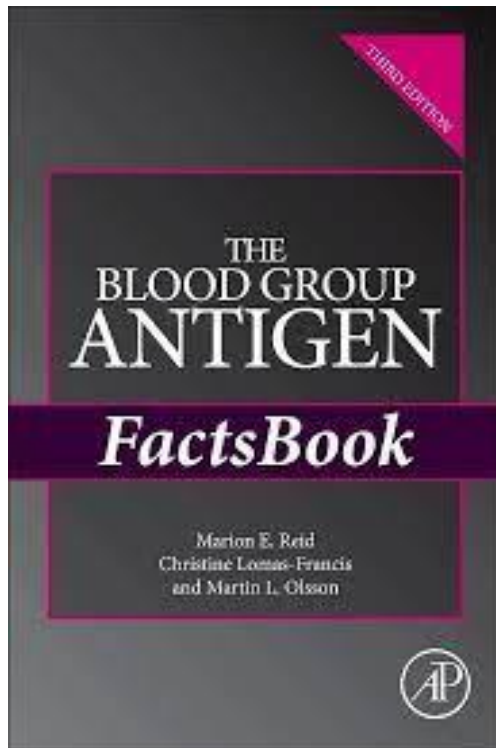
- More helpful information:

Patient Notes:

SCREENING DATE	NOTE
	Other = unidentified reactivity against all cells in PEG and ficin; DTT treatment weakened reactivity



A Case of the Unexpected - ish



Ficin/Papain	Trypsin	α -Chymotrypsin	200 mM DTT/AET	Possible specificity
Negative	Negative	Negative	Positive	Bp ^a ; Ch/Rg; XG
Negative	Negative	Negative	Negative	IN; JMH
Negative	Negative	Positive	Positive	M, N, En ^a TS; Ge2, Ge4
Negative	Positive	Negative	Positive	'N'; Fy ^a , Fy ^b
Variable	Positive	Negative	Positive	S, s
Variable	Positive	Negative	Weak or negative	YT
Negative	Positive	Positive	Positive	En ^a FS
Positive	Negative	Negative	Weak or negative	LU, MER2
Positive - Papain	Negative	Negative	Negative	KN
Weak or negative - Ficin				
Positive	Negative	Weak	Negative	DO
Positive	Positive	Negative	Weak	CROM
Positive	Positive	Negative	Positive	Some DI (3 rd loop)
Positive	Positive	Positive/weak	Negative	LV
Positive	Positive/weak	Positive/weak	Positive	SC
Positive	Positive [^]	Positive [^]	Negative	KEL [^] (except KAL1, which is trypsin sensitive)
Positive	Positive	Positive	Positive	ABO; En ^a FR, U; P1PK; RH; LE; Fy3; JK; most DI; CO; H; Ge3; OK; Ii; P; FOR5; JR; LAN, Cs ^a ; ER; LKE, PX2; Vel, [†] ABTI; At ^a ; Emm; AnWj; Sd ^a ; PEL; MAM

A Case of the Unexpected - ish

- Without further delay, we decide to send a sample to the IRL at CBC...

		Rh					Kell				Duffy		Kidd		Lewis		MNS				PEG IAT
		D	C	E	c	e	K	k	Kp ^a	Kp ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Lu ^a	Lu ^b	M	N	S	s	
1	R ₂ R ₂	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	0	+	0	+	Weak Pos
2	r'r	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	Weak Pos
3	R ₁ R ₁	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	Weak Pos
4	rr	0	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	Weak Pos
5	R ₁ R ₁	+	+	0	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	Weak Pos
6	R ₂ R ₂	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	0	+	0	+	Weak Pos
7	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	Weak Pos
8	rr	0	0	0	+	+	+	0	0	+	+	+	0	+	0	+	0	+	+	0	Weak Pos
9	rr	0	0	0	+	+	0	+	+	+	0	+	0	+	0	+	0	+	+	0	Weak Pos

		Rh					Kell		Kp ^a	Kp ^b	Duffy		Kidd		Lewis		MNS				Ficin/DTT
		D	C	E	c	e	K	k			Fy ^a	Fy ^b	Jk ^a	Jk ^b	Lu ^a	Lu ^b	M	N	S	s	
1	R ₂ R ₂	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	0	+	0	+	Weak Pos
2	r'r	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	Weak Pos
3	R ₁ R ₁	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	Weak Pos
4	rr	0	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	Weak Pos
5	R ₁ R ₁	+	+	0	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	Weak Pos
6	R ₂ R ₂	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	0	+	0	+	Weak Pos
7	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	Weak Pos
8	rr	0	0	0	+	+	+	0	0	+	+	+	0	+	0	+	0	+	+	0	Weak Pos
9	rr	0	0	0	+	+	0	+	+	+	0	+	0	+	0	+	0	+	+	0	Weak Pos

A Case of the Unexpected - ish

- Nothing has worked yet.....
- IRL can try running cells again that are negative for high prevalence antigens!

Rare Cells	PEG IAT
Tj(a-)	
Kn -	
Lan -	
Sc:-3	
Anwj -	
Lu (a-b-)	

A Case of the Unexpected - ish

- Nothing has worked yet.....
- IRL can try running cells again that are negative for high prevalence antigens!

Rare Cells	PEG IAT
Tj(a-)	
Kn -	
Lan -	
Sc:-3	
Anwj -	
Lu (a-b-)	

A Case of the Unexpected - ish

- With no solid identification, CBC-IRL sent a sample to NYBC-IRL for further serologic testing
- CBC-IRL did recommend providing phenotypically matched RBC while the investigation continues
 - Sent 1 f-negative, K-negative, Jk(a-), S-negative unit prior to the completion of the workup

A Case of the Unexpected - ish

- NYBC-IRL was able to provide some additional information:

ANTIBODY IDENTIFICATION AND PLASMA RESULTS:

Antibody to a high-prevalence antigen in the Cromer blood group system is suspected.

Anti-K reactive by PEG IAT.

Anti-Jka reactive by PEG IAT.

Suspected anti-Doa reactive by PEG IAT.

Cold autoantibody reactive in saline at 4C.

To facilitate the exclusion of additional alloantibodies, adsorption and elution studies were performed. No other unexpected antibodies were detected by PEG IAT in the absorbed plasma.

ELUATE RESULTS:

Due to recent transfusions, an acid eluate was prepared from the patient's red cells. The acid eluate was non-reactive with all panel cells tested by PEG IAT.

ADDITIONAL COMMENTS:

The patient's sample was submitted for additional DNA analysis of *CROM (DAF)*. To the extent of the DNA-based testing performed, no changes were found associated with an altered Cromer phenotype (MA# 1905-24). It is possible that alterations in *DAF* that were not interrogated by our testing may exist.

A Case of the Unexpected - ish

Ficin/Papain	Trypsin	α -Chymo-trypsin	200 mM DTT/AET	Possible specificity
Negative	Negative	Negative	Positive	Bp ^a ; Ch/Rg; XG
Negative	Negative	Negative	Negative	IN; JMh
Negative	Negative	Positive	Positive	M, N, En ^a TS; Ge2, Ge4
Negative	Positive	Negative	Positive	'N'; Fy ^a , Fy ^b
Variable	Positive	Negative	Positive	S, s
Variable	Positive	Negative	Weak or negative	YT
Negative	Positive	Positive	Positive	En ^a FS
Positive	Negative	Negative	Weak or negative	LU, MER2
Positive – Papain Weak or negative – Ficin	Negative	Negative	Negative	KN
Positive	Negative	Weak	Negative	DO
Positive	Positive	Negative	Weak	CROM
Positive	Positive	Negative	Positive	Some DI (3 rd loop)
Positive	Positive	Positive/weak	Negative	LW
Positive	Positive/weak	Positive/weak	Positive	SC
Positive	Positive [^]	Positive [^]	Negative	KEL [^] (except KALT, which is trypsin sensitive)
Positive	Positive	Positive	Positive	ABO; En ^a FR, U; P1PK; RH; LE; Fy3; JK; most DI; CO; H; Ge3; OK; IJ; P; FOR5; III

A Case of the Unexpected - ish

- What now?
 - Unfortunately, there is not always an answer!
 - Unexpected reactivity should not be ignored, even if we aren't ever able to get a definitive answer
 - If able, phenotypically matched and/or emergent use only units can be given

Questions?