Antibody to a Low Frequency RH sySTEM antigen/s implicated in HDFN

Red Cell Reference Laboratory

Ina Messig

Presentation

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Baby jaundiced

Baby has a positive DAT

Eluate made from baby’s cells is non-reactive with panel cells and A1 cells, but positive with Dad’s cells

Mum has a negative antibody screen

antibody to a low frequency antigen

Initial Testing

um

- Group O Rh(D) Positive
- C+E-c+e+Cw- (probable R1r), K-, Fy(a-b+), Jk(a+b-), M+N-S+s+
- DAT: Negative
- Antibody Screen: Negative

ad

- Group A Rh(D) Weak Positive
- C+E-c+e+Cw- (probable R1r), K-k+, Fy(a+b-), Jk(a+b-), M+N+S+s+
- DAT: Negative

aby

- Group A, Rh(D) Positive
- C+E-c+e+Cw- (probable R1r), K-, Jk(a+b-), M+N-S+s-
- DAT: Strongly positive due to IgG (score 12)

Further Investigation - Mum

Cell No.	Antigen	CAT
1	Wr(a+)	0
2	Cx+	0
3	SC:2	0
4	Vw+	0
5	SARA+	0
6	Tr(a+)	0
7	He+, St(a+)	0
8	Tar+	0
9	Di(a+)	0
10	MUT+	0
11	Mur+	0
12	V+VS+	0
13	Cw+	0
14	Kp(a+)	0
15	? LFA	0
16	Co(b+)	0
17	Lu(a+)	0

Further Investigation - Mum

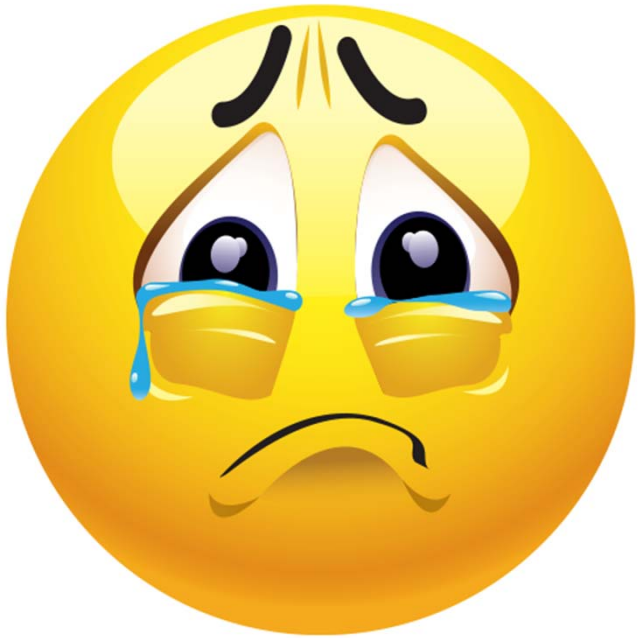
Cell	15'SRT	PEG-IAT	Papain	0.2M DTT	6% AET	Trypsin	Chymotrypsin
Dad	0	3+	3+s	3+s	0		0

Further Testing- Mum

Cell No.	Antigen	15’SRT	PEG-IAT
1	Lu:14	0	0
2	Lu:14	0	0

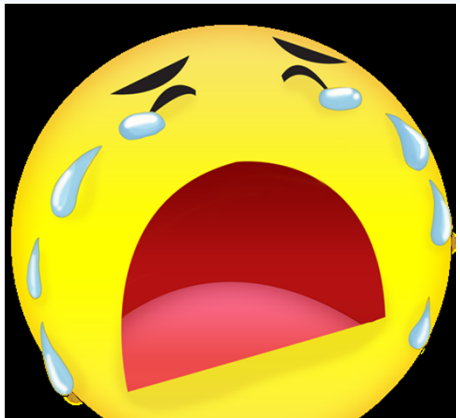
Further Investigation - Mum

mple No.	Antigen Specificity	15’ SRT	RAM-IAT
1	SC:4 (Rd+)	0	0
2	SC:4 (Rd+)	0	0

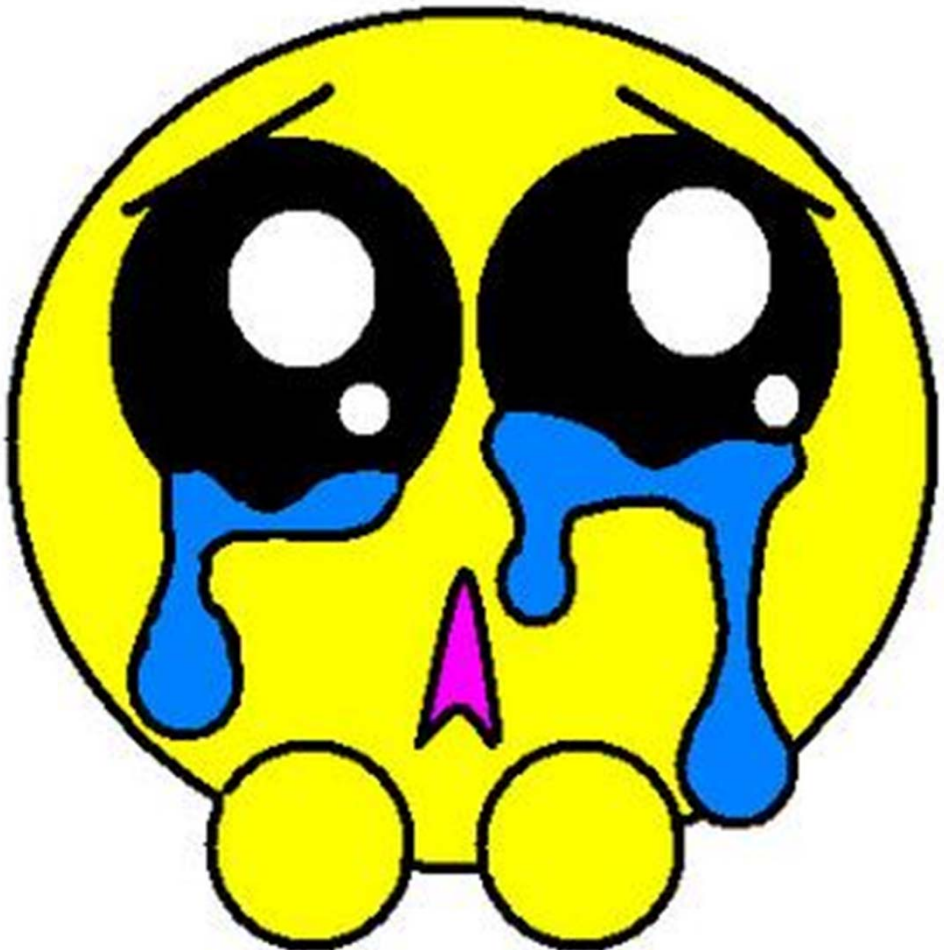


Moving on to Dad

Multi-Low	Specificities	Result
1	Bp^a, By, Dantu, Hg^a, Mt^a, NFLD, Or^a, Pt^a, Rb^a, SARA, Sw^a, Tr^a, Wd^a, Wu, WARR, Wr^a	0
2	Cx, Pt^a, Rb^a, Wr^a (also anti-K)	0
3	By, Fra, Mur, Mta, Rba, Tra, Vw, WARR, Wra, Wu	0
N/A	Anti-SC:4 (Anti-Rd)	0



Moving on to Baby



Where to now?!!!

equested more sample for further investigation

- Baby affected – jaundiced
- Determine the specificity prior to Mum’s next pregnancy
- Perform titration

eferred to Queensland

- DNA extracted and being held by the RCR laboratory
- Determine the system/systems we may wish to look at after confirming our reaction patterns with a new sample

3 months later……

dditional sample was received on Mum, Dad and Baby

equencing results from the previous samples were now available.
ad and Baby had identical results;

- Heterozygosity for c.509T>C and c.667T>G – This variant defines the *RHD*12.01* allele and the Partial D DOL1 RH:54 (DAK+) phenotype
- Heterozygosity for c.1132C>G, c.818C>T and c.712A>G – This variant defines the *RHCE*01.08* allele and the ce RH:-19 (hrs-) RH:49 (STEM+) e+/- phenotype
- CNV analysis indicated 2 copies of the RHD gene were present with the predicted genotype *RHD*01//*12.01* and *RHCE*01.08/02*
- Therefore the predicted Phenotype is D+C+c+E-e+, RH;49 (STEM+) and RH:54 (DAK+)

Results of Serological Testing

ell	15' SRT	RAM 37°C	IAT	BioRad LISS /Coombs Cards	Papain	0.2M DTT	6% AET	Trypsin	Chymotrypsin
	0		±		2+	±	0	0	0
	0	0	2+		3+	2+	0	0	2+
M+^{w}				1+	0				
EM+				2+	4+				
EM+				2+	4+				

??? Anti-STEM

STEM Vs DAK

ssociated with Dce haplotypes that
o not produce hr^{s} (RH19)

alleles with a *RHCE*ce818C>T*
ncoding the e+/- hr^{s}- STEM+
henotype (*RHCE*ceBI and*
*HCE*ceSM*)

ften in cis to *RHD*DOL1* or
*HD*DOL2*

- *Encoded by RHD*DIIIa, RHD*DOL and RHCE*CeRN*

A recent Article[1] that tested a small cohort of STEM+ samples found that 14 out of 14 STEM+ cells were also DAK+

Where does this leave us?!!!

- nable to determine whether the antibody is anti-STEM or anti-DAK or OTH!
- nti-STEM has been implicated in mild HDFN whilst anti-DAK is resumed to be significant
- here have not been any reported cases of transfusion reactions nplicating either antigen
- OOOOOOO does it matter????
  - Transfusion IAT crossmatch compatible
  - Monitoring of future pregnancies – anti-A can be absorbed out of mums plasma and titred against Dad's cells

References and acknowledgements

Reid et al. The low-prevalence Rh antigen STEM (RH49) is ncoded by two different RHCE*ce818T alleles that are often in cis to *HD*DOL*, Transfusion 2013;53:539-544.

hankyou to the NSW Reference Laboratory for kindly sharing their re red cells with us allowing us to complete our investigation.

hankyou to the Queensland Reference and Research Laboratories r performing sequencing and assisting with report interpretation.

Australian governments fund the Australian Red Cross Blood Service to provide blood, blood products and services to the Australian community