NHS
Blood and Transplant

Antibody Knowledge and Identification.

Presented by
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27th January 2012

Red Cell Immunohaematology, NHSBT-Tooting Centre.

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Are all ABO antibodies clinically significant?

Red Cell Immunohaematology, NHSBT-Tooting Centre.

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NO!

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Are antigen/antibody reactiosn within the MNS and Duffy Blood Group Systems destroyed by the action of proteolytic enzymes?

Red Cell Immunohaematology, NHSBT-Tooting Centre.

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NO!

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Is anti-Jk^{a} implicated in most cases of delayed haemolytic transfusion reactions?

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YES!

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Case 1.

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	Gp	Rh	[redacted]	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	[redacted]	Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$		0	0	+	0	+	0	+	0	+		0	+	0	0
2	O	R_1R_1		3	0	+	+	+	0	+	+	0		+	0	0	2+
3	O	R_2R_2		0	+	+	0	+	0	+	0	+		0	+	0	2+
4	O	r'r		5	0	+	0	+	0	+	0	0		0	+	0	0
5	O	r"r		2	0	+	0	+	0	+	+	0		+	0	0	0
6	O	rr		2	0	+	0	+	0	+	0	+		+	0	0	0
7	O	rr		5	0	+	+	+	0	+	+	0		0	+	0	2+
8	O	rr		5	+	+	0	+	0	+	0	+		+	0	0	0
9	O	rr		4	0	+	0	+	+	+	0	+		+	0	0	2+
10	O	rr		5	0	+	+	0	0	+	0	+		+	0	0	0
I	O	R_1R_1		3	0	+	+	+	0	+	+	0		+	0	0	0
II	O	R_2R_2		0	0	+	0	+	0	+	0	+		0	+	0	2+

NHS Blood and Transplant

	Gp	Rh	[redacted]	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	[redacted]	Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$		0	0	+	0	+	0	+	0	+		0	+	0	0
2	O	R_1R_1		3	0	+	+	+	0	+	+	0		+	0	0	2+
3	O	R_2R_2		0	+	+	0	+	0	+	0	+		0	+	0	2+
4	O	r'r		5	0	+	0	+	0	+	0	0		0	+	0	0
5	O	r"r		2	0	+	0	+	0	+	+	0		+	0	0	0
6	O	rr		2	0	+	0	+	0	+	0	+		+	0	0	0
7	O	rr		5	0	+	+	+	0	+	+	0		0	+	0	2+
8	O	rr		5	+	+	0	+	0	+	0	+		+	0	0	0
9	O	rr		4	0	+	0	+	+	+	0	+		+	0	0	2+
10	O	rr		5	0	+	+	0	0	+	0	+		+	0	0	0
I	O	R_1R_1		3	0	+	+	+	0	+	+	0		+	0	0	0
II	O	R_2R_2		0	0	+	0	+	0	+	0	+		0	+	0	2+

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	Gp	Rh		N	S	s	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	Fy^a	Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$		+		+	0	0	+	0	+	0	+	0	+	+	0	+	0	0
2	O	R_1R_1					3	0	+	+	+	0	+	+	0		+	0	0	2+
3	O	R_2R_2	0				0	+	+	0	+	0	+	0	+		0	+	0	2+
4	O	r'r					5	0	+	0	+	0	+	0	0	+	0	+	0	0
5	O	r"r		+		+	2	0	+	0	+	0	+	+	0		+	0	0	0
6	O	rr		+	+		2	0	+	0	+	0	+	0	+		+	0	0	0
7	O	rr					5	0	+	+	+	0	+	+	0		0	+	0	2+
8	O	rr			+		5	+	+	0	+	0	+	0	+	+	+	0	0	0
9	O	rr				+	4	0	+	0	+	+	+	0	+		+	0	0	2+
10	O	rr		+			5	0	+	+	0	0	+	0	+	+	+	0	0	0
I	O	R_1R_1				+	3	0	+	+	+	0	+	+	0	+	+	0	0	0
II	O	R_2R_2					0	0	+	0	+	0	+	0	+		0	+	0	2+

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	Gp	Rh		N	S	s	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	Fy^a	Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$		+		+	0	0	+	0	+	0	+	0	+	+	0	+	0	0
2	O	R_1R_1					3	0	+	+	+	0	+	+	0		+	0	0	2+
3	O	R_2R_2	0				0	+	+	0	+	0	+	0	+		0	+	0	2+
4	O	r'r					5	0	+	0	+	0	+	0	0	+	0	+	0	0
5	O	r"r		+		+	2	0	+	0	+	0	+	+	0		+	0	0	0
6	O	rr		+	+		2	0	+	0	+	0	+	0	+		+	0	0	0
7	O	rr					5	0	+	+	+	0	+	+	0		0	+	0	2+
8	O	rr			+		5	+	+	0	+	0	+	0	+	+	+	0	0	0
9	O	rr				+	4	0	+	0	+	+	+	0	+		+	0	0	2+
10	O	rr		+			5	0	+	+	0	0	+	0	+	+	+	0	0	0
I	O	R_1R_1				+	3	0	+	+	+	0	+	+	0	+	+	0	0	0
II	O	R_2R_2					0	0	+	0	+	0	+	0	+		0	+	0	2+

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	Gp	Rh		N	S	s	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	Fy^a	Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$		+		+	0	0	+	0	+	0	+	0	+	+	0	+	0	0
2	O	R_1R_1					3	0	+	+	+	0	+	+	0		+	0	0	2+
3	O	R_2R_2	0				0	+	+	0	+	0	+	0	+		0	+	0	2+
4	O	r'r					5	0	+	0	+	0	+	0	0	+	0	+	0	0
5	O	r"r		+		+	2	0	+	0	+	0	+	+	0		+	0	0	0
6	O	rr		+	+		2	0	+	0	+	0	+	0	+		+	0	0	0
7	O	rr					5	0	+	+	+	0	+	+	0		0	+	0	2+
8	O	rr			+		5	+	+	0	+	0	+	0	+	+	+	0	0	0
9	O	rr				+	4	0	+	0	+	+	+	0	+		+	0	0	2+
10	O	rr		+			5	0	+	+	0	0	+	0	+	+	+	0	0	0
I	O	R_1R_1				+	3	0	+	+	+	0	+	+	0	+	+	0	0	0
II	O	R_2R_2					0	0	+	0	+	0	+	0	+		0	+	0	2+

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Can we dismiss anti-M?

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NO!

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You should never exclude on one cell. This cell may be M+Mk.

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	Gp	Rh	N	S	s	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	Fy^a	Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$	+		+	0	0	+	0	+	0	+	0	+	+	0	+	0	0
2	O	R_1R_1				3	0	+	+	+	0	+	+	0		+	0	0	2+
3	O	R_2R_2				0	+	+	0	+	0	+	0	+		0	+	0	2+
4	O	r'r				5	0	+	0	+	0	+	0	0	+	0	+	0	0
5	O	r"r	+		+	2	0	+	0	+	0	+	+	0		+	0	0	0
6	O	rr	+	+		2	0	+	0	+	0	+	0	+		+	0	0	0
7	O	rr				5	0	+	+	+	0	+	+	0		0	+	0	2+
8	O	rr		+		5	+	+	0	+	0	+	0	+	+	+	0	0	0
9	O	rr			+	4	0	+	0	+	+	+	0	+		+	0	0	2+
10	O	rr	+			5	0	+	+	0	0	+	0	+	+	+	0	0	0
I	O	R_1R_1			+	3	0	+	+	+	0	+	+	0	+	+	0	0	0
II	O	R_2R_2				0	0	+	0	+	0	+	0	+		0	+	0	2+

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Do we think it is anti-Fy^b?

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	Gp	Rh	N	S	s	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	Fy^a		Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$	+		+	0	0	+	0	+	0	+	0	+	+		0	+	0	0
2	O	R_1R_1				3	0	+	+	+	0	+	+	0			+	0	0	2+
3	O	R_2R_2				0	+	+	0	+	0	+	0	+			0	+	0	2+
4	O	r'r				5	0	+	0	+	0	+	0	0	+		0	+	0	0
5	O	r"r	+		+	2	0	+	0	+	0	+	+	0		+		+	0	0	0
6	O	rr	+	+		2	0	+	0	+	0	+	0	+		+		+	0	0	0
7	O	rr				5	0	+	+	+	0	+	+	0			0	+	0	2+
8	O	rr		+		5	+	+	0	+	0	+	0	+	+		+	0	0	0
9	O	rr			+	4	0	+	0	+	+	+	0	+			+	0	0	2+
10	O	rr	+			5	0	+	+	0	0	+	0	+	+		+	0	0	0
I	O	R_1R_1			+	3	0	+	+	+	0	+	+	0	+		+	0	0	0
II	O	R_2R_2				0	0	+	0	+	0	+	0	+			0	+	0	2+

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Two Fy(b+) cells are Negative by IAT.

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So can we dismiss anti-Fy^b?

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NO!

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Both cells are Fy(a+b+).

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Group the patient for the M and Fy(b) antigens?

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YES!

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The patient is M- and Fy(b-)!!!!!!

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Test the plasma against 2 x M+N-, Fy(b-) and 2 x M-N+, Fy(a-b+) cells?

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YES!

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In this case the specificity is anti-Fy^b.

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Case 2.

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	Gp	Rh	[redacted]	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	[redacted]	Jk^a	Jk^b	Pap	IAT
1	O	$R_1^wR_1$		0	0	+	0	+	0	+	0	+		0	+	5+	5+
2	O	R_1R_1		3	0	+	+	+	0	+	+	0		+	0	5+	5+
3	O	R_2R_2		0	+	+	0	+	0	+	0	+		0	+	5+	5+
4	O	r'r		5	0	+	0	+	0	+	0	0		0	+	5+	5+
5	O	r"r		2	0	+	0	+	0	+	+	0		+	0	5+	5+
6	O	rr		2	0	+	0	+	0	+	0	+		+	0	5+	5+
7	O	rr		5	0	+	+	+	0	+	+	0		0	+	5+	5+
8	O	rr		5	+	+	0	+	0	+	0	+		+	0	5+	5+
9	O	rr		4	0	+	0	+	+	+	0	+		+	0	5+	5+
10	O	rr		5	0	+	+	0	0	+	0	+		+	0	5+	5+
I	O	R_1R_1		3	0	+	+	+	0	+	+	0		+	0	5+	5+
II	O	R_2R_2		0	0	+	0	+	0	+	0	+		0	+	5+	5+

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The DAT is 5+ by anti-IgG and anti-C3d. The “auto” is positive by papain and IAT.

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So, this is an auto-antibody. Is it safe to give ABO, Rh and K-matched blood?

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NO!

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The auto-antibody may be masking a clinically-significant alloantibody or antibodies.

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So, do we perform an *in vivo* cross-match?

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NO!!!!!!

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The patient was transfused 2 months ago.

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Do we perform auto-adsorptions?

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NO, there may still be transfused red cells in the circulation that will adsorb out an unknown alloantibody.

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Do we perform differential alloadsorptions?

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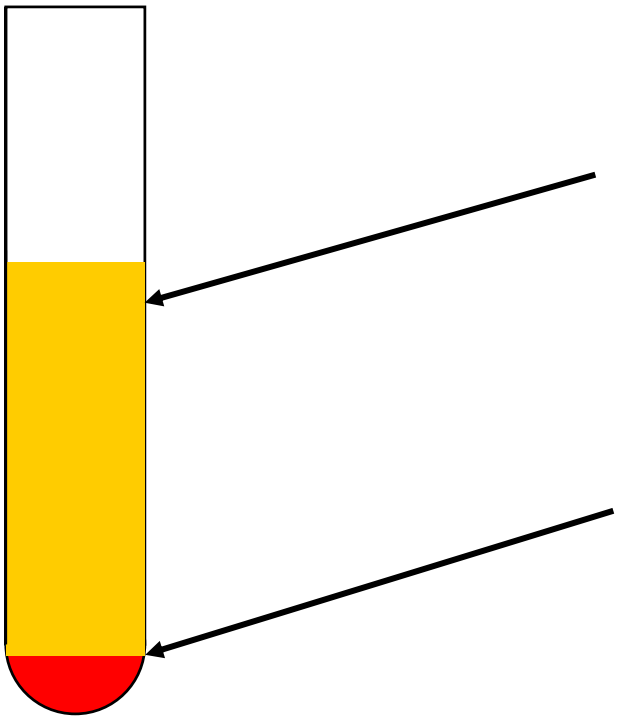
YES!

Adsorption.

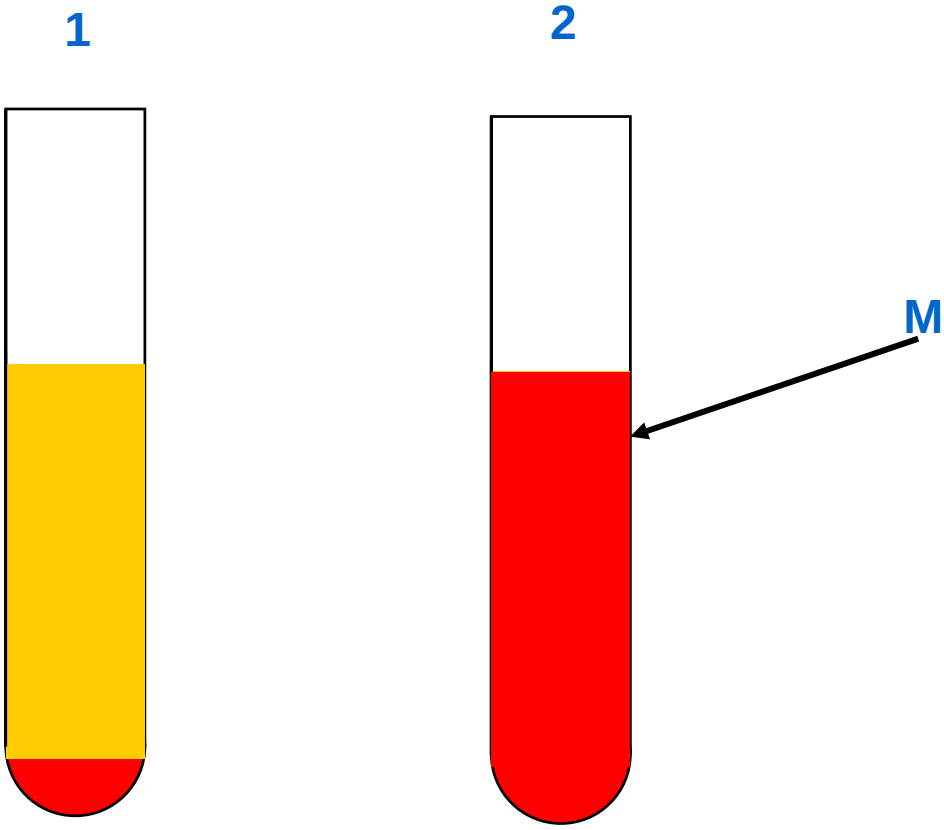
1



Add patient's serum/plasma.

Papain-treated red cells.
Autologous or phenotyped allogeneic
R_1R_1, R_2R_2 or rr.

Adsorption.



Mix and incubate for 20 minutes at 37°C or 4°C.

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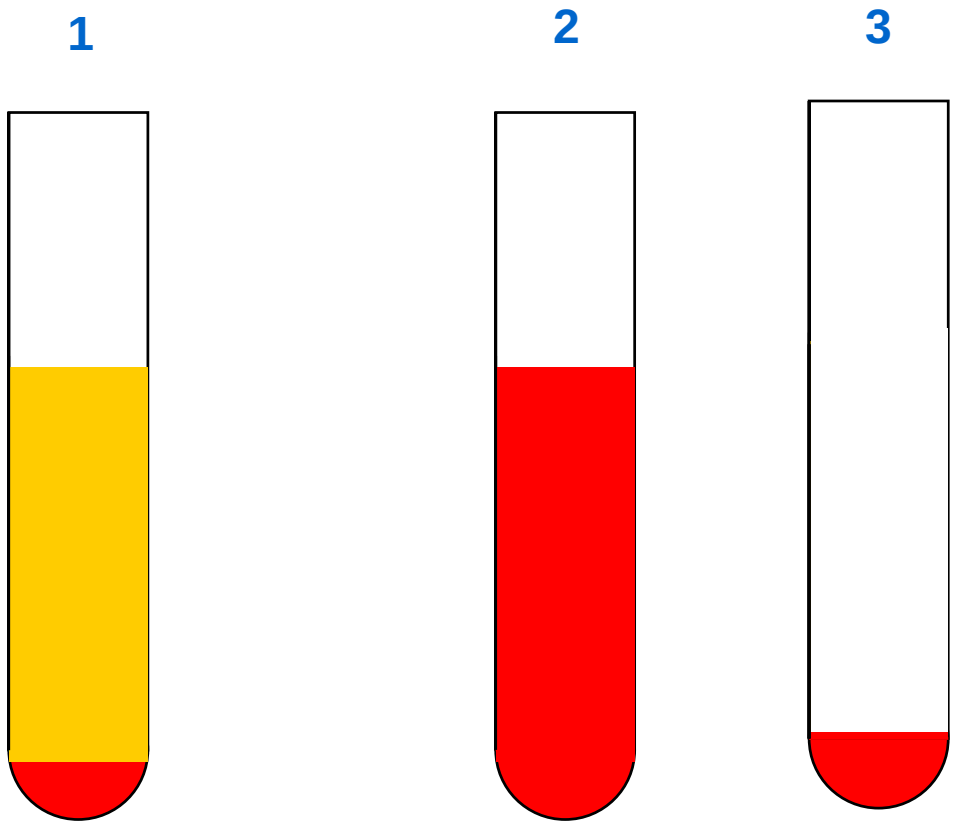
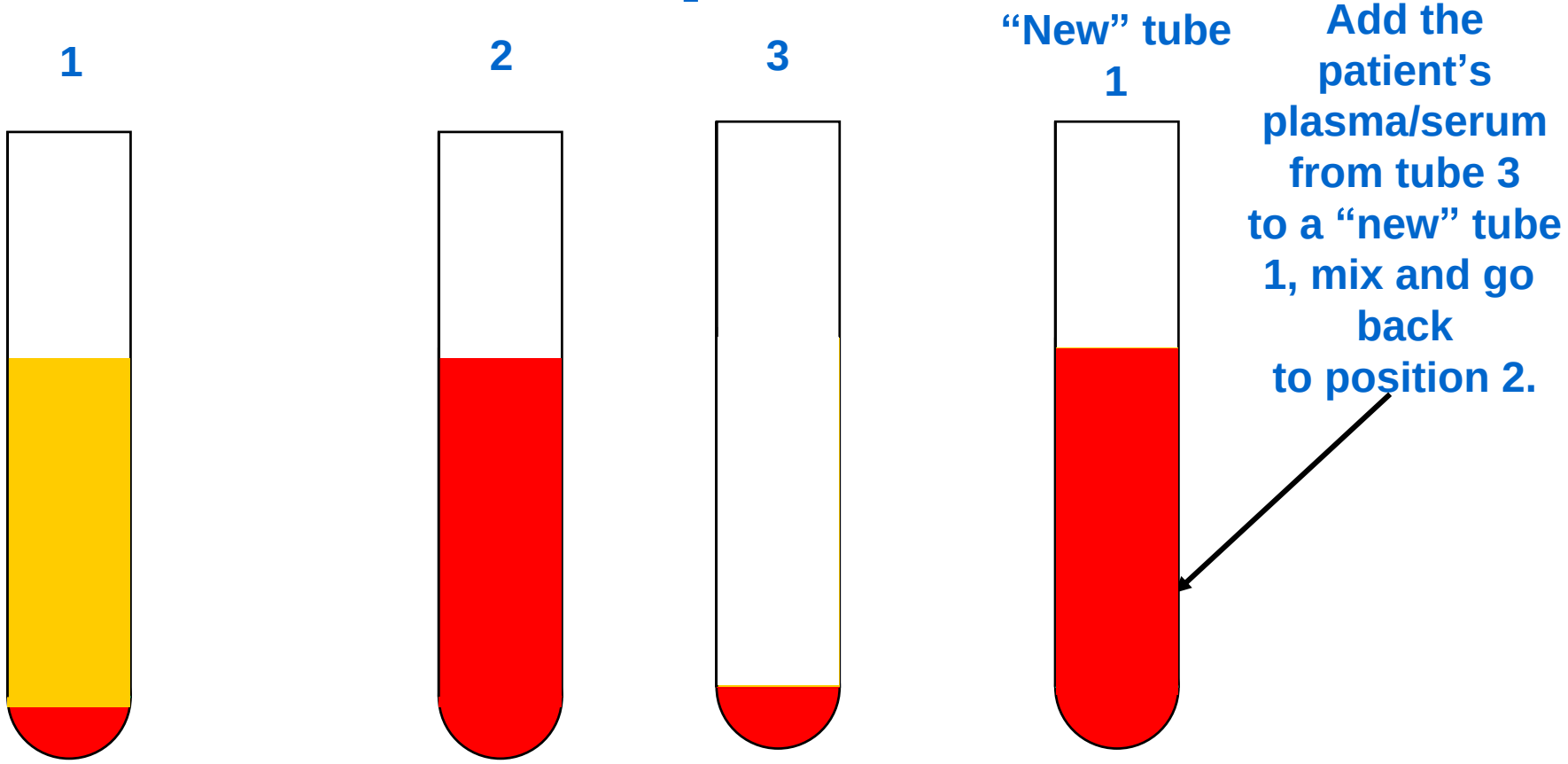
Adsorption.



Centrifuge, and aspirate the patient's plasma/serum.

Adsorption.


1
2
3
“New” tube 1
Add the patient’s plasma/serum from tube 3 to a “new” tube 1, mix and go back to position 2.

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FRM/LIV/RE/300/01

3 CELL Papainised Allo-absorption Cells *NBS REAGENTS CAMBRIDGE*

Product	Lot No.	Expiry
OR1R1	R4022022	2005.01.28
Orr	R4032022	
OR2R2	R4042022A	

Concentration is 30 ± 2%.

Only C ,D ,E ,c ,e ,C^w ,K ,Jk^a and Jk^b types have been confirmed.

Rh	C	D	E	c	e	C^w	M	N	S	s	P1	K	k	Kp^a	Le^a	Le^b	Fy^a	Fy^b	Jk^a	Jk^b	Other
R_1R_1	+	+	0	0	+	0	+	+	+	+		0		0	0	+	+	+	+	0	
rr	0	0	0	+	+	0	+	+	0	+		+	+	0	0	+	+	+	0	+	
R_2R_2	0	+	+	+	0	0	0	+	0	+	+	0		0	0	+	+	+	0	+	

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	GP	Rh	M	N	S	s	P1	Lu^a	Lu^b	K	k	Kp^a	Kp^b	Le^a	Le^b	Fy^a	Fy^b	Jk^a	Jk^b	Adsorbed R_1R_1	Adsorbed R_2R_2	Adsorbed rr
1	O	$R_1^wR_1$	0	+	0	+	0	0	+	0	+	0	+	0	+	+	0	0	+	0	0	0
2	O	R_1R_1	+	0	+	0	3	0	+	+	+	0	+	+	0	0	+	+	0	0	4+	4+
3	O	R_2R_2	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	+	0	0	0
4	O	r'r	+	+	+	+	5	0	+	0	+	0	+	0	0	+	0	0	+	0	0	0
5	O	r"r	0	+	0	+	2	0	+	0	+	0	+	+	0	+	+	+	0	0	4+	4+
6	O	rr	0	+	+	0	2	0	+	0	+	0	+	0	+	+	+	+	0	0	4+	4+
7	O	rr	+	0	+	0	5	0	+	+	+	0	+	+	0	0	+	0	+	0	0	0
8	O	rr	+	+	+	0	5	+	+	0	+	0	+	0	+	+	0	+	0	0	4+	4+
9	O	rr	+	+	0	+	4	0	+	0	+	+	+	0	+	0	+	+	0	0	4+	4+
10	O	rr	0	+	0	+	5	0	+	+	0	0	+	0	+	+	0	+	0	0	4+	4+
I	O	R_1R_1	+	+	0	+	3	0	+	+	+	0	+	+	0	+	0	+	0	0	4+	4+
II	O	R_2R_2	+	0	+	0	0	0	+	0	+	0	+	0	+	0	+	0	+	0	0	0

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This patient has an underlying anti-Jk^{a}, so it was a good job we ***didn't*** do an *in vivo* cross-match!!!!!!!!!

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Why?

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