



Resident Rotation: Immunohematology Reference Lab (IRL) Module 7: Adsorptions

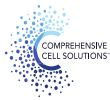


Lynsi Rahorst, MHPE, MT(ASCP)SBB^{CM}
Manager, Education and Training IRL/Genomics
NYBC Enterprise
lrahorst@cbckc.org



New York Blood Center Enterprises

EXPANDING OUR ORGANIZATION TO MEET CLINICAL, CELLULAR AND TRANSFUSION PRODUCT AND SERVICE NEEDS FOR PATIENTS. NOW PROVIDING ALMOST ONE MILLION BLOOD PRODUCTS, OVER 450,000 LABORATORY AND MULTI-ASSAY INFECTIOUS DISEASE TESTS AND OVER 12,500 SPECIALTY CLINICAL PROCEDURES ANNUALLY TO HOSPITALS NATIONWIDE.



Objectives

- Review common reactions for warm autoantibody workups.
- Discuss adsorption of warm autoantibody, both autologous and allogeneic.
- Describe differential adsorptions that are utilized when a patient's phenotype is unknown.



“Typical Warm Auto Workup”

ABO/Rh						
Front type				Back type		Interpretation
Anti-A	Anti-B	Anti-D	Rh control	A ₂ cells	B cells	
4+	0	4+	0	0	4+	A+

Antibody Screen														
Rh					Kell		Duffy		Kidd		MNS			
D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s
SCI	+	+	0	0	+	+	+	+	+	+	+	+	+	+
SCII	+	+	0	0	+	+	+	+	+	+	+	+	+	+
SCIII	+	0	+	+	0	0	+	+	+	+	+	+	+	+

Antibody screen panreactive



“Typical Warm Auto Workup”

Antibody Panel																
Rh					Kell		Duffy		Kidd		MNS				Results	
D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	Plasma LISS IAT	Eluate PEG IAT
1	+	+	0	0	+	0	+	+	+	+	+	+	+	+	3+	3+
2	+	+	0	0	+	+	+	+	+	+	+	+	+	+	3+	3+
3	+	0	+	+	0	0	+	+	+	+	+	+	+	+	3+	3+
4	+	0	0	+	+	0	+	+	+	+	+	+	+	+	3+	3+
5	0	+	0	+	+	0	+	+	+	+	+	+	+	0	3+	3+
6	+	+	+	+	0	0	+	+	+	+	+	+	+	+	3+	3+
7	+	+	+	+	+	+	+	+	+	+	+	+	+	+	3+	3+
8	0	+	+	+	0	+	+	+	+	+	+	+	+	+	3+	3+
9	0	+	+	+	0	+	+	+	+	+	+	+	0	0	3+	3+
10	0	+	+	+	0	+	+	+	+	+	+	+	+	0	3+	3+
11	+	+	0	0	+	+	+	+	+	+	+	+	+	+	3+	3+
Auto															3+	NT

* EGA-treated, DAT-negative autologous RBCs

DAT			
Polyspecific	Anti-IgG	Anti-C3b,C3d	Saline Control
3+	3+	1+	0

“Typical Warm Auto Workup”

Problem:

- Panreactive plasma and eluate
 - Unable to rule out presence of alloantibodies
 - Recall: rule outs performed on negative reactions

Rh		Kell		Duffy		Kidd		Lewis		P		MNS		Lutheran		Xg		Results
C	c	C ⁺	C ⁻	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Le ^a	Le ^b	M	N	S	s	L ^a	L ^b	X ^a	X ^b	
1	+	+	0	0	0	0	+	+	+	+	+	+	+	+	+	+	+	2+
2	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	+	+	3+
3	+	0	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	2+
4	0	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	0
5	0	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	0
6	0	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	2+
7	0	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	0
8	0	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	0
9	0	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	3+
10	0	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	0
11	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	+	+	2+
Auto																		0

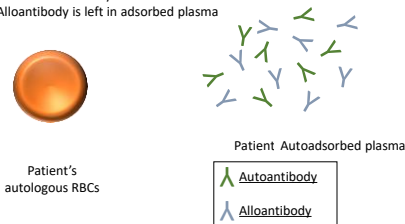
Objectives

- Review common reactions for warm autoantibody workups.
- Discuss adsorption of warm autoantibody, both autologous and allogeneic.
- Describe differential adsorptions that are utilized when a patient's phenotype is unknown.



Autoadsorption

- Patient's autologous cells + patient plasma
- Warm autoantibody attaches to the RBCs
- Alloantibody is left in adsorbed plasma



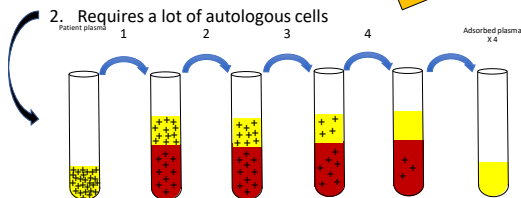
Autoadsorption

Two important criteria:

1. Patient can't be recently transfused

2. Requires a lot of autologous cells

Many times, our patients with warm autos don't meet these criteria...



Alloadsorption

- If patient doesn't meet previously stated criteria, perform **alloadsorptions**
- Use someone else's cells to adsorb autoantibody

How do we choose an adsorbing cell?

- Phenotype-matched to patient
- **Phenotype-matched** = negative for the common antigens that the patient cells lack



Phenotype-Matched

Let's say our patient's phenotype is as follows:

R₁r; K-; Fy(a+b-), Jk(a-b+), S+,s+

Our patient is negative for the following common antigens:

E-, K-, Fy(b-), Jk(a-)

So, our adsorbing cell needs to be negative for the same antigens:

E-, K-, Fy(b-), Jk(a-)



Phenotype-Matched Adsorbing Cell

REVIEW:

Patient phenotype:

rr; K-; Fy(a+b+), Jk(a+b-), S+s-

Which cell could be used as an adsorbing cell?

rr; K-; Fy(a+b-); Jk(a+b-); S+s-



Alloadsorption: how it works

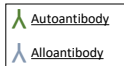
- Phenotype-matched adsorbing cells + patient plasma
- Warm autoantibody attaches to the RBCs
- Alloantibody is left in adsorbed plasma



Phenotype-matched adsorbing cell



Patient Alloadsorbed plasma



Alloadsorption

Treatment of allogeneic adsorbing cells:

- Papain/Ficin treatment (Enzymes)
 - Warm autoantibodies react better with enzyme-treated cells
 - Antigens destroyed: MNSs, Fy^a, Fy^b

Don't have to match for antigens destroyed by enzyme-treatment!



Papain-treated adsorbing cells

So, let's say our patient's phenotype is as follow:

R₁R₁; K-; Fy(a-b+); Jk(a-b+); S+s+

Our patient's cells are negative for:

E-, c-, K-, Fy(a-), Jk(a-)

But since our adsorbing cells will be papain. treated, we don't have to match for Fy(a-)

- Through papain/ficin- treatment, adsorbing cell will become Fy(a-)
- We will match for:

E-, c-, K-, Jk(a-)



Allodisorption: example

		Rh					Kell		Duffy		Kidd		MNS					Results	
		D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	Plasma IAT	Eluate IAT	Ads plasma IAT
1	R ₁ R ₁	+	+	0	0	+	0	+	+	+	+	+	+	+	+	+	2+	3+	Ads plasma IAT
2	R ₁ R ₁	+	+	0	0	+	+	+	+	0	+	0	+	0	+	0	2+	3+	Ads plasma IAT
3	R ₁ R ₂	+	0	+	+	0	0	+	+	0	+	+	+	0	+	+	2+	3+	(0)V
4	r'r	0	0	+	+	0	0	+	0	0	+	0	+	+	0	+	2+	3+	(0)V
5	r'R	0	+	0	+	+	0	+	+	0	+	0	+	+	0	0	2+	3+	(0)V
6	r'r	0	0	+	+	0	0	+	0	+	+	0	+	0	+	+	2+	3+	(0)V
7	rr	0	0	0	+	+	+	+	0	+	0	+	0	+	+	+	2+	3+	1+
8	rr	0	0	0	+	+	0	+	+	0	+	0	+	+	+	+	2+	3+	(0)V
9	rr	0	0	0	+	+	0	+	+	0	+	0	+	0	0	+	2+	3+	(0)V
10	R ₁ R ₁	+	+	0	0	+	0	+	+	0	+	+	+	+	+	0	2+	3+	(0)V
11	R ₂ R ₂	+	0	0	+	+	+	+	0	0	+	+	+	+	+	+	2+	3+	1+
Auto																	3+	3+	

*Patient's autologous, DAT= negative cells

*Patient's autologous, DAT-negative cells



Interpretation

		Rh					Kell		Duffy		Kidd		MNS					Results		
		D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	Plasma IAT	Eluate IAT	Ads plasma IAT	
1	R ₁ R ₁	+	+	0	0	+	0	+	+	+	+	+	+	+	+	+	2+	3+	+	
2	R ₁ R ₁	+	+	0	0	+	+	0	+	0	+	0	+	0	+	+	2+	3+	+	
3	R ₁ R ₂	+	0	+	+	0	0	+	+	0	+	+	+	0	+	+	2+	3+	+	
4	R ₂ R ₂	+	0	0	+	+	0	+	0	0	+	0	+	+	0	+	2+	3+	+	
5	r'r	0	+	0	+	+	0	+	+	0	+	0	+	0	0	+	2+	3+	+	
6	r'R	0	0	+	+	+	0	+	+	0	+	0	+	0	+	+	2+	3+	+	
7	rr	0	0	0	+	+	+	0	+	0	+	0	+	+	+	+	2+	3+	+	
8	rr	0	0	0	+	+	0	+	+	0	+	0	+	+	+	+	2+	3+	+	
9	rr	0	0	0	+	+	0	+	+	0	+	+	0	0	+	+	2+	3+	+	
10	R ₁ R ₁	+	+	0	0	+	0	+	+	0	+	+	+	+	0	+	2+	3+	+	
11	R ₂ R ₂	+	0	0	+	+	+	0	+	0	+	+	+	+	+	+	2+	3+	+	
Auto																	3+	3+	+	

*Patient's autologous, OAT-negative cells

*Patient's autologous, DAT-negative cells

Warm autoantibody has been adsorbed. Alloodsorbed plasma contains anti-k



The biggest risk of Alloodsorption

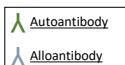
Adsorbing a clinically significant alloantibody onto the allogeneic adsorbing cells



Phenotype-matched adsorbing cell

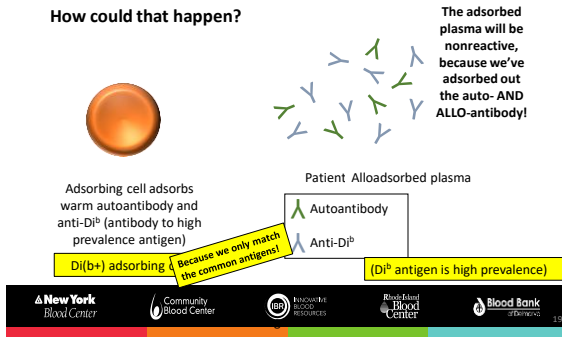


Patient Plasma



The biggest risk of Alloadsorption

How could that happen?



The biggest risk of alloadsorption:

Adsorbing a clinically significant alloantibody onto the allogeneic adsorbing cells (especially against an antigen of high prevalence)

- Small probability of this happening
- Reports have disclaimer that this is a risk of alloadsorption



Comparison of Autoadsorption and Alloadsorption

	Autoadsorption	Alloadsorption
Adsorbing cell	W.A.R.M. treated autologous cell	Papain-treated phenotype matched RBC
Adsorbed plasma	Can rule out alloantibodies	Can rule out alloantibody to common RBC antigens
Disclaimer	NA	Cannot rule out alloantibodies to antigens of high prevalence
Criteria	• No recent transfusion • Have sufficient autologous RBCs	NA



Objectives

- Review common reactions for warm autoantibody workups.
- Discuss adsorption of warm autoantibody, both autologous and allogeneic.
- Describe differential adsorptions that are utilized when a patient's phenotype is unknown.



Comparison of Autoadsorption and Alloadsorption

	Autoadsorption	Alloadsorption
Adsorbing cell	W.A.R.M. treated autologous cell	Papain-treated phenotype matched RBC
Adsorbed p	What happens if I don't know my patient's phenotype?	Can rule out alloantibody to common RBC antigens
Disclaimer		Cannot rule out alloantibodies to antigens of high prevalence
Criteria	• No recent transfusion • Have sufficient autologous RBCs	NA



Patient phenotype unknown

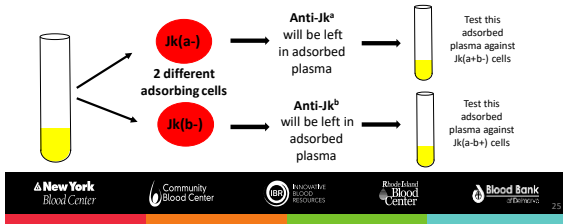
- Recently transfused
- Sample problems
 - Extremely high WBC count
 - RBCs with very strongly positive DATs
- Molecular genotyping (avoids above problems) TAT



Patient phenotype unknown

- Use different adsorbing cells to rule out different antibodies
- Example:

We don't know patient's Kidd typings:



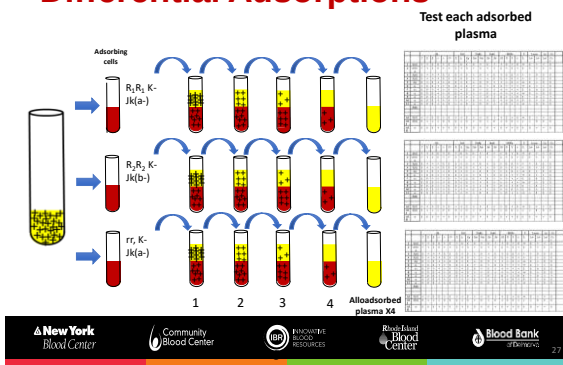
Differential adsorptions: when patient phenotype is unknown

- Adsorptions with 3 different papain-treated adsorbing cells:
 1. R_1R_1
 2. R_2R_2
 3. rr
- At least one of these has to be
 - Jk(a-)
 - Jk(b-)
 - K-

Any clinically significant alloantibody to a common RBC antigen will remain in at least one of the adsorbed plasmas.



Differential Adsorptions



Video: enzyme-treating adsorbing cells & performing adsorptions



Testing the adsorbed plasma

		Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
		D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	+	++	+++
1	R ₁ R ₁	+	+	0	0	+	0	+	+	+	0	+	0	+	0	+	(0N)	(0N)	(0N)
2	R ₂ R ₂	+	0	+	+	0	0	+	+	0	+	+	+	+	+	2+	(0N)	2+	
3	rr	0	0	0	+	+	+	+	0	+	+	0	+	0	+	0	(0N)	(0N)	(0N)

*Plasma adsorbed with papain treated R₁R₁; K-; Jk(a-)

**Plasma adsorbed with papain treated R₂R₂; K-; Jk(b-)

***Plasma adsorbed with papain treated rr; K-; Jk(a-)

With each adsorbed plasma, you can only rule out antibodies against antigens that were lacking on the corresponding adsorbing cells.



Differential adsorption

Antigens on adsorbing cells: These antibodies will be removed

Antigens absent on adsorbing cells: These antibodies remain in adsorbed plasma

Papain-treated adsorbing cell	What antigens are present on this adsorbing cell? (antibodies to these antigens will be removed from adsorbed plasma)	What antigens are not present on this adsorbing cell? (antibodies to these antigens will remain in adsorbed plasma)
R ₁ R ₁ , K-, Fy(a-b+), Jk(a-b+), S+s-	D, C, e, Jk ^b	E, c, K, Fy ^a , Fy ^b , Jk ^a , M, N, S, s
R ₂ R ₂ , K-, Fy(a+b+), Jk(a+b-), S+s+	D, c, E, Jk ^a	C, e, K, Fy ^a , Fy ^b , Jk ^b , M, N, S, s
rr, K- Fy(a+b-), Jk(a-b+), S+s+	c, e, Jk ^b	D, C, E, K, Fy ^a , Fy ^b , Jk ^a , M, N, S, s



Testing the adsorbed plasma

		Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
		D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1	R ₁ R ₂	+	+	0	0	+	0	+	+	+	0	+	0	+	0	+	(0V)	(0V)	(0V)
2	R ₁ R ₂	+	0	+	+	0	0	+	+	0	+	+	+	+	+	+	2+	(0V)	2+
3	rr	0	0	0	+	+	+	+	0	+	+	0	+	0	+	0	(0V)	(0V)	(0V)

*Plasma adsorbed with papain treated R₁R₂; K-; Jk(a-)

**Plasma adsorbed with papain treated R₂R₂; K-; Jk(b-)

***Plasma adsorbed with papain treated rr; K-; Jk(a-)



Testing the adsorbed plasma

		Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
		D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1	R ₁ R ₂	+	+	0	0	+	0	+	+	+	0	+	0	+	0	+	(0V)	(0V)	(0V)
2	R ₁ R ₂	+	0	+	+	0	0	+	+	0	+	+	+	+	+	+	2+	(0V)	2+
3	rr	0	0	0	+	+	+	+	0	+	+	0	+	0	+	0	(0V)	(0V)	(0V)

*Plasma adsorbed with papain treated R₁R₂; K-; Jk(a-)

E-,c-,K-,Fy(a-),Fy(b-),Jk(a-),M-,N-,S-,S-

**Plasma adsorbed with papain treated R₂R₂; K-; Jk(b-)

C-,e-,K-,Fy(a-),Fy(b-),Jk(b-),M-,N-,S-,S-

***Plasma adsorbed with papain treated rr; K-; Jk(a-)

D-,C-,E-,K-,Fy(a-),Fy(b-),Jk(a-),M-,N-,S-,S-



Testing the adsorbed plasma

		Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
		D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1	R ₁ R ₂	+	+	0	0	+	0	+	+	+	0	+	0	+	0	+	(0V)	(0V)	(0V)
2	R ₁ R ₂	+	0	+	+	0	0	+	+	0	+	+	+	+	+	+	2+	(0V)	2+
3	rr	0	0	0	+	+	+	+	0	+	+	0	+	0	+	0	(0V)	(0V)	(0V)

→ *Plasma adsorbed with papain treated R₁R₂; K-; Jk(a-)

E-,c-,K-,Fy(a-),Fy(b-),Jk(a-),M-,N-,S-,S-

**Plasma adsorbed with papain treated R₂R₂; K-; Jk(b-)

C-,e-,K-,Fy(a-),Fy(b-),Jk(b-),M-,N-,S-,S-

***Plasma adsorbed with papain treated rr; K-; Jk(a-)

D-,C-,E-,K-,Fy(a-),Fy(b-),Jk(a-),M-,N-,S-,S-



Testing the adsorbed plasma

	Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
	D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1 R ₁ R ₂	+	+	0	0	+	+	+	+	0	+	+	0	+	+	+	0	0	0
2 R ₁ R ₂	+	+	+	+	0	+	+	+	0	+	+	+	+	+	+	2+	0	2+
3 rr	0	0	0	+	+	+	+	0	+	+	0	+	0	+	0	0	0	0

*Plasma adsorbed with papain treated R₁R₂; K⁻; Jk(a⁻)

E⁻, c⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻

→ **Plasma adsorbed with papain treated R₂R₂; K⁻; Jk(b⁻)

C⁻, e⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(b⁻), M⁻, N⁻, S⁻, s⁻

***Plasma adsorbed with papain treated rr; K⁻; Jk(a⁻)

D⁻, C⁻, E⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻



Testing the adsorbed plasma

	Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
	D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1 R ₁ R ₂	+	+	0	0	+	+	+	+	0	+	+	0	+	+	+	0	0	0
2 R ₁ R ₂	+	+	+	+	0	+	+	+	0	+	+	+	+	+	+	2+	0	2+
3 rr	0	0	0	+	+	+	+	0	+	+	0	+	0	+	0	0	0	0

*Plasma adsorbed with papain treated R₁R₂; K⁻; Jk(a⁻)

E⁻, c⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻

**Plasma adsorbed with papain treated R₂R₂; K⁻; Jk(b⁻)

C⁻, e⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(b⁻), M⁻, N⁻, S⁻, s⁻

→ ***Plasma adsorbed with papain treated rr; K⁻; Jk(a⁻)

D⁻, C⁻, E⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻



Testing the adsorbed plasma

	Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
	D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1 R ₁ R ₂	+	+	0	0	+	+	+	+	0	+	+	0	+	+	+	0	0	0
2 R ₁ R ₂	+	+	+	+	0	+	+	+	0	+	+	+	+	+	+	2+	0	2+
3 rr	0	0	0	+	+	+	+	0	+	+	0	+	0	+	0	0	0	0

*Plasma adsorbed with papain treated R₁R₂; K⁻; Jk(a⁻)

E⁻, c⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻

→ **Plasma adsorbed with papain treated R₂R₂; K⁻; Jk(b⁻)

C⁻, e⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(b⁻), M⁻, N⁻, S⁻, s⁻

***Plasma adsorbed with papain treated rr; K⁻; Jk(a⁻)

D⁻, C⁻, E⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻



Testing the adsorbed plasma

	Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
	D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1 R ₁ R ₂	0	0	0	0	0	0	+	+	+	0	0	0	0	0	0	0	0	0
2 R ₁ R ₂	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	2+	0	2+
3 rr	0	0	0	0	0	+	+	0	0	0	0	0	0	0	0	0	0	0

- ***Plasma adsorbed with papain treated R₁R₂; K⁻; Jk(a⁻)**
E⁻, c⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻
****Plasma adsorbed with papain treated R₂R₂; K⁻; Jk(b⁻)**
C⁻, e⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(b⁻), M⁻, N⁻, S⁻, s⁻
*****Plasma adsorbed with papain treated rr; K⁻; Jk(a⁻)**
D⁻, C⁻, E⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻



Testing the adsorbed plasma

	Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
	D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1 R ₁ R ₂	0	0	0	0	0	0	+	+	+	0	0	0	0	0	0	0	0	0
2 R ₁ R ₂	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	2+	0	2+
3 rr	0	0	0	0	0	+	+	0	0	0	0	0	0	0	0	0	0	0

- ***Plasma adsorbed with papain treated R₁R₂; K⁻; Jk(a⁻)**
E⁻, c⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻
****Plasma adsorbed with papain treated R₂R₂; K⁻; Jk(b⁻)**
C⁻, e⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(b⁻), M⁻, N⁻, S⁻, s⁻
*****Plasma adsorbed with papain treated rr; K⁻; Jk(a⁻)**
D⁻, C⁻, E⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻



Testing the adsorbed plasma

	Rh					Kell		Duffy		Kidd		MNS				LISS IAT		
	D	C	E	c	e	K	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1 R ₁ R ₂	0	0	0	0	0	0	+	+	+	0	0	0	0	0	0	0	0	0
2 R ₁ R ₂	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	2+	0	2+
3 rr	0	0	0	0	0	+	+	0	0	0	0	0	0	0	0	0	0	0

- ***Plasma adsorbed with papain treated R₁R₂; K⁻; Jk(a⁻)**
E⁻, c⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻
****Plasma adsorbed with papain treated R₂R₂; K⁻; Jk(b⁻)**
C⁻, e⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(b⁻), M⁻, N⁻, S⁻, s⁻
*****Plasma adsorbed with papain treated rr; K⁻; Jk(a⁻)**
D⁻, C⁻, E⁻, K⁻, Fy(a⁻), Fy(b⁻), Jk(a⁻), M⁻, N⁻, S⁻, s⁻



Testing the adsorbed plasma

		Rh				Kell		Duffy		Kidd		MNS				LISS IAT		
		D	C	E	c	k	k	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	*	**	***
1	R ₁ R ₂	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2	R ₁ R ₂	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3	rr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Plasma adsorbed with papain treated R₁R₂; K-; Jk(a-)

E-, c-, K-, Fy(a-), Fy(b-), Jk(a-), M-, N-, S-, s-

**Plasma adsorbed with papain treated R₁R₂; K-; Jk(b-)

C-, e-, K-, Fy(a-), Fy(b-), Jk(b-), M-, N-, S-, s-

***Plasma adsorbed with papain treated rr; K-; Jk(a-)

D-, C-, E-, K-, Fy(a-), Fy(b-), Jk(a-), M-, N-, S-, s-

More testing is needed!

- Need another rule in for anti-E (with plasma adsorbed with R₁R₂ or rr)



What you'll do in the lab

- You'll be given warm auto sample
- You'll enzyme-treat aliquots of adsorbing cells for differential adsorptions
- You'll perform adsorptions
- You'll test each adsorbed plasma and interpret results



Objectives

- Review common reactions for warm autoantibody workups.
- Discuss adsorption of warm autoantibody, both autologous and allogeneic.
- Describe differential adsorptions that are utilized when a patient's phenotype is unknown.





