

ANTIBODY DETECTION/ ANTIBODY IDENTIFICATION

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Goals of Transfusion Service

- Prevent Hemolytic Transfusion Reactions--HTR
- Prevent and/or treat Hemolytic Disease of the Newborn--HDN

Pre-transfusion Testing

- Positive identification of recipient and recipient's blood sample
- ABO/Rh typing of recipient's sample
- Red cell antibody detection test for clinically significant antibodies using recipient's serum or plasma
- Check of the recipient's current test results with previous records

Pre-transfusion Testing

- Confirmation of ABO group of donor red cell products
- Confirmation of D type of D negative donor red cell products
- Selection of ABO/Rh donor blood products compatible with recipient
- Performance of serologic or electronic crossmatch

Sample Identification

- 2 unique identifiers
 - Full name
 - Last four digits of Social Security Number, birth date or other unique number
- Must match information on recipient's band
- Written requisition for blood products must have same identifiers

Sample needed

- For a first time patient with no previous record TWO SAMPLES are needed to perform ABO / Rh type.
- This is to confirm patient's identity.
- To avoid misidentification of the patient.

5.14.5 Pretransfusion Testing for Allogeneic Transfusion

There shall be two determinations of the recipient's ABO group as specified in ~~Standard 5.14.1~~. The first determination shall be performed on a current sample, and the second determination by one of the following methods:

- 1) Testing a second current sample.
- 2) Comparison with previous records.
- 3) Retesting the same sample if patient identification was verified using an electronic identification system or another process validated to reduce the risk of misidentification.

5.14.6 Comparison with Previous Records

There shall be a process to ensure that the historical records for the following have been reviewed:

- 1) ABO group and Rh type.
- 2) Difficulty in blood typing.
- 3) Clinically significant antibodies.
- 4) Significant adverse events to transfusion.
- 5) Special transfusion requirements.

These records shall be compared to current results, and any discrepancies shall be investigated and appropriate action taken before a unit is issued for transfusion.

Antibody Detection/ Screening

- Purpose is to look for clinically significant antibodies in serum of intended recipient
- If antibody is detected, must be identified and assessed for clinical significance

Antibody Detection/ Screening

- Donor antibody
 - May not use plasma, may use red cells
- Recipient antibody
 - Clinically insignificant
 - Donor red cell products need not be antigen negative
 - Clinically significant
 - Donor red cell products must be crossmatch compatible and antigen negative

Screening Cells

- Group O cells
- Tested for following red cell antigens:
D, C, c, E, e, K, k, Fy^a, Fy^b, Jk^a, Jk^b,
Le^a, Le^b, P₁, M, N, S, s
- 2-vial or 3-vial sets
 - Recipient testing
- 1-vial pool of 2 red cell sources
 - Donor testing

Screening Cells

- Adhere to manufacturer's directions for testing and storage
- Match lot numbers
- Adhere to expiration date
- Examine for contamination / hemolysis

Screening Cell Antigen Profile

Manuf. ARC inhouse		Lot # 2345				Exp. Date 06/01/02																	
	Rh								Kell				Duffy		Kidd		Lewis		P	MNS			
	D	C	E	c	e	f	V	C^w	K	k	Kp^a	Js^a	Fy^a	Fy^b	Jk^a	Jk^b	Le^a	Le^b	P₁	M	N	S	s
I R₁R₁	+	+	0	0	+	0	0	0	+	+	0	0	0	+	+	+	0	+	+	+	+	+	0
II R₂R₂	+	0	+	+	0	0	0	0	0	+	0	0	+	0	+	+	+	0	+	+	+	0	+

Screening Cell Antigen Profile

Manuf. ARC inhouse		Lot # 6789				Exp. Date 06/01/02																	
	Rh								Kell				Duffy		Kidd		Lewis		P	MNS			
	D	C	E	c	e	f	V	C ^w	K	k	Kp ^a	Js ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Le ^a	Le ^b	P ₁	M	N	S	s
I R ₁ R ₁	+	+	0	0	+	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	+	+
II R ₂ R ₂	+	0	+	+	0	0	0	0	0	+	0	0	+	0	+	+	0	+	+	+	0	+	0
III rr	0	0	0	+	+	+	0	0	0	+	0	0	0	+	0	+	+	0	0	0	+	0	+

Screening Cell Antigen Profile

Manuf. ARC inhouse		Lot # 6789				Exp. Date 06/01/02																	
	Rh								Kell				Duffy		Kidd		Lewis		P	MNS			
	D	C	E	c	e	f	V	C ^w	K	k	Kp ^a	Js ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Le ^a	Le ^b	P ₁	M	N	S	s
I R ₁ R ₁	+	+	0	0	+	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	+	+
II R ₂ R ₂	+	0	+	+	0	0	0	0	0	+	0	0	+	0	+	+	0	+	+	+	0	+	0
III rr	0	0	0	+	+	+	0	0	0	+	0	0	0	+	0	+	+	0	0	0	+	0	+

Screening Cell Antigen Profile

Manuf. ARC inhouse		Lot # 6789				Exp. Date 06/01/02																	
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	D	C	E	c	e	f	V	C ^w	K	k	Kp ^a	Js ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Le ^a	Le ^b	P ₁	M	N	S	s
I R ₁ R ₁	+	+	0	0	+	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	+	+
II R ₂ R ₂	+	0	+	+	0	0	0	0	0	+	0	0	+	0	+	+	0	+	+	+	0	+	0
III rr	0	0	0	+	+	+	0	0	0	+	0	0	0	+	0	+	+	0	0	0	+	0	+

Antibody Detection Test Tube Method

- 2 drops of serum
- 1 drop of each reagent screening cell
- Phases of testing
 - Immediate spin--optional
 - 37°C incubation /enhancement--optional
 - AHG--required

Antibody Detection Test Interpretation

- Negative
 - No agglutination / hemolysis in all phases with all screening cells
 - Indicates no “detectable” antibodies
- Positive
 - Agglutination /hemolysis in any phase with any of the screening cells
 - Requires antibody identification

Ways of Detecting Antibodies

- Antibody detection test
- ABO discrepancy investigation
- Incompatible crossmatch
- Previous records of antibody not currently demonstrating

Positive Antibody Detection Test

- Clinically insignificant antibody
 - Typically IgM---Room temp reactions only
- Potentially clinically significant antibody
 - Typically IgG---37°C / AHG reactions

Antibody Identification

- Uses manufacturer's reagent cells
 - Panel of 8-11 cells
- Group O cells
- Same required antigenic determinants as screening cells
- Usually same testing method / phases as initial antibody detection test

Panel Worksheet

Manuf.	ARC inhouse								Lot # 5446								Exp. Date 06/01/02															
	Rh								Kell				Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns						
	D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	Kn ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	JK ^a	JK ^b	Le ^a	Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b					
1	+	+	0	0	+	0	0	0	0	+	0	+	0	+	+	+	+	0	+	+	+	0	+	0	0	0	+					
2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+					
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+					
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	0	0	0	+	+	+	0	+					
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	+					
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	+	0	+	0	+					
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	+	+				
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	0	0	+				
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	+	0	0	+	0	+	0	+					
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	+	0	+	+	+	+	0	+					
11	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	+	0	0	+	0	+				
Pt																																

Auto Control

- Testing of serum and autologous cells
 - Same method and phases as panel
- Provides serum blank for reference
- Indicates allo or possible autoantibody
 - Importance of transfusion/ medication history
 - In recently transfused recipient, may indicate delayed transfusion reaction

Panel Worksheet #1

Manuf.	ARC inhouse										Lot # 5432								Exp. Date 06/01/02											
	Rh								Kell				Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS				
	D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	Kn ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	JK ^a	JK ^b	Le ^a	Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	37	AHG
1	+	+	+	0	+	0	0	0	0	+	0	+	0	+	+	+	+	+	+	0	+	+	0	+	0	0	+	3+	0	0√
2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	0	0√
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	0	0√
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	0	0	0	+	0	+	0	+	0	0	0√
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0√
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0√
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	+	0	0	0√
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0√
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	+	0	0	+	0	+	0	+	0	0	0√
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	0	+	+	0	+	0	+	2+	0	0√
11	+	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	0	+	0	+	3+	0	0√
Pt																												0	0	0√

Antibody Identification Process

1. Obtain information regarding historical antibodies, transfusions and medications
2. Other clinically significant antibodies must be excluded
3. Apply 2+/ 2^- rule to identify antibody

Evaluation of Information

- Check historical testing records
- Obtain transfusion and medication information

Antibody Exclusions

- Look at antigens on nonreactive panel cells that have double dose expression
- Since serum did not react with double dose of antigen, can exclude this antibody from the serum
- If cell with double dose antigen not available, test at least 2 cells with single dose antigen expression

Antibody Exclusions

- Exceptions to double dose rule
 - No common antithetical antigen
 - D, C^w, f, V, P₁
 - High incidence antithetical antigen
 - K
- Antigen type autologous red cells
 - If positive for antigen, antibody is excluded

Antibody Identification

- Historically used Fisher exact method
 - Used 3+/3- rule
- Currently, use 2+/2- Rule
 - At least 2 reagent cells positive for the antigen are reactive
 - At least 2 reagent cells negative for the antigen are nonreactive

Reaction Pattern

- May see extra reactions
- May see missing reactions
 - Weak antibody not reacting with cells with single dose antigen expression
- Must investigate
- May require enhancement techniques

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		D	C	E	c	e	f	V	C ^w	K	k	K ^a	K ^b	J ^a	J ^b	Fy ^a	Fy ^b	JK ^a	JK ^b	Le ^a	Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3 7	A H G
1		+	+	+	0	+	0	0	0	0	+	0	+	0	+	+	+	+	0	+	+	0	+	0	0	0	+	3+	0	0√	
2		+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	+	0	+	+	0	0	+	0	0	+	0	0	0√	
3		+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	+	+	0	0	+	0	0	+	0	0	0√	
4		0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	0	0	0	0	+	0	+	0	+	0	0	0√	
5		0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	2+	0	0√	
6		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	0	+	+	+	+	0	+	0	0	+	2+	0	0√	
7		0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	+	+	0	+	0	+	+	+	+	+	0	0	0√	
8		+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	+	0	0	+	+	0	+	0	0	0	+	3+	0	0√
9		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	+	0	+	0	0	+	0	0	0√
10		+	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	0	+	+	0	+	0	0	+	2+	0	0√
11		+	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	0	0	+	3+	0	0√
Pt																												0	0	0√	

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	D	C	E	c	e	f	V	--C ^w	K	k	Kn ^a	--Kn ^b	Js ^a	--Js ^b	Fy ^a	--Fy ^b	JK ^a	--JK ^b	Le ^a	Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A
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2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	+	0	+	+	0	+	+	0	+	0	0	+	0	0	0√	
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	+	0	+	0	+	+	+	0	+	0	0	+	0	0	0√	
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	0	0	0	+	0	+	0	0	0	0√	
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0√	
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0√	
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	+	+	+	+	0	0	0√
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0√	
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	0	+	0	+	0	+	0	0	0√
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	0	+	0	+	2+	0	0√
11	+	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	0	+	3+	0	0√	
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		D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	--Kn ^b	Js ^a	--Js ^b	Fy ^a	--Fy ^b	JK ^a	--JK ^b	Le ^a	--Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A			
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2		+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	+	+	0	+	0	+	0	+	0	+	0	+	0	0	0√		
3		+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	0	0√		
4		0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	0	0	0	+	0	+	0	+	0	+	0	0	0√		
5		0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0√			
6		0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	+	0	+	2+	0	0√				
7		0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	+	+	0	0	+	0	+	+	+	+	+	+	0	0	0√		
8		+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	+	3+	0	0√				
9		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	0	0	+	0	+	0	+	0	+	0	0	0√		
10		+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	0	+	0	+	2+	0	0√			
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	D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	--Kn ^b	Js ^a	--Js ^b	Fy ^a	--Fy ^b	JK ^a	--JK ^b	Le ^a	--Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A	
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2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+	0	+	0	+	0	0	0√	
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+	0	+	0	0	0√	
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	0	0	0	0	+	0	+	0	+	0	0	0√	
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	0	0	+	+	+	+	0	+	0	+	0	+	2+	0	0√
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	+	0	+	0	+	2+	0	0√
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	+	+	0	0	+	0	+	+	+	+	+	0	0	0√	
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0√	
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	0	+	0	+	0	0	+	0	0	0√
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	0	+	0	+	2+	0	0√	
11	+	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	+	+	+	0	0	+	0	+	3+	0	0√	
Pt																												0	0	0√	

Panel Worksheet #1

Manuf.	ARC inhouse										Lot # 5432					Exp. Date 06/01/02																				
	Rh								Kell				Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS										
	D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	--Kn ^b	Js ^a	--Js ^b	--Fy ^a	Fy ^b	JK ^a	JK ^b	--Le ^a	Le ^b	--P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A	7	H	G			
1	+	+	+	0	+	0	0	0	0	+	0	+	0	+	+	+	+	+	+	0	+	+	+	0	+	0	0	+	3+	0	0	0	0	0	0	0
2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	0	+	+	0	+	+	0	+	0	0	+	0	0	0	0	0	0	0	0	
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0	+	0	0	0	0	0	0	0	0	
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	0	0	+	0	+	0	0	+	0	0	0	0	0	0	0	0	
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0	0	0	0	0	
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0	0	0	0	0	
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	0	+	+	0	+	+	+	+	0	0	0	0	0	0	0	0	
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0	0	0	0	0	0	
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	+	0	0	+	0	+	0	+	0	0	0	0	0	0	0	0	
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	0	+	+	0	+	0	+	2+	0	0	0	0	0	0	0	
11	+	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	+	0	0	+	3+	0	0	0	0	0	0	0	
Pt																												0	0	0	0	0	0	0	0	

Panel Worksheet #1

Manuf.	ARC inhouse										Lot # 5432						Exp. Date 06/01/02																		
	Rh							Kell						Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS								
	D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	--Kn ^b	Js ^a	--Js ^b	Fy ^a	Fy ^b	JK ^a	--JK ^b	Le ^a	--Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A	7	H	G		
				I	I	I				I													I		I		I								
1	+	+	+	0	+	0	0	0	0	+	0	+	0	+	+	+	+	+	0	+	+	0	+	0	0	+	3+	0	0	0	√				
2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	0	0	0	√			
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	0	0	0	√			
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	0	0	0	0	+	0	+	0	+	0	0	0	0	√			
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0	√			
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0	√				
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	+	+	0	0	0	√			
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0	0	√			
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	+	0	0	+	0	+	0	+	0	0	0	0	√			
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	0	+	+	0	+	0	+	2+	0	0	0	√			
11	+	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	0	+	0	+	3+	0	0	0	√			
Pt																											0	0	0	0	√				

Panel Worksheet #1

Manuf.		ARC inhouse										Lot # 5432					Exp. Date 06/01/02																				
	Rh							Kell					Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS											
	D	C	E	c	e	f	V	1C ^w	K	k	K ^{no} ^a	5K ^{no} ^b	J ^s ^a	5J ^s ^b	1Fy ^a	3Fy ^b	1JK ^a	3JK ^b	3Le ^a	2Le ^b	3P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	37	AH	G						
	3	1	1	3	4	3			2	3													5	4	1	4											
1	+	+	+	0	+	0	0	0	+	0	+	0	+	+	+	+	+	0	+	+	0	+	0	0	+	3+	0	0	0	√							
2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	0	+	0	0	0	0	√						
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	0	0	+	0	0	0	0	√						
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	0	0	0	0	+	0	+	0	+	0	0	0	0	√					
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0	0	√					
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0	0	√					
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	+	+	0	0	0	0	√				
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0	0	0	√				
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	+	0	0	+	0	+	0	+	0	0	0	0	0	0	√			
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	0	+	0	+	2+	0	0	0	0	0	√			
11	+	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	0	+	0	+	3+	0	0	0	0	0	√			
Pt																																		0	0	0	√

Panel Worksheet #1

Manuf.		ARC inhouse										Lot # 5432					Exp. Date 06/01/02																				
		Rh							Kell					Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS										
		D	C	E	c	e	f	V	1C ^w	K	k	K ^a	5K ^b	J ^a	5J ^b	1Fy ^a	3Fy ^b	1JK ^a	3JK ^b	3Le ^a	2Le ^b	3P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A	7	H	G			
		3	1	1	3	4	3		1	2	3	5	5	5	1	3	1	3	3	2	3			5		4	1	4									
1		+	+	+	0	+	0	0	0	0	+	0	+	0	+	+	+	+	+	+	0	+	+	0	+	0	+	0	+	3+	0	0	0	0	0	0	0
2		+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	0	+	+	0	+	0	+	+	0	+	0	+	0	0	0	0	0	0	0	0
3		+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	0	0	0	0	0	0	0
4		0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	0	0	0	+	+	0	+	0	+	0	0	0	0	0	0	0	0
5		0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	0	+	0	+	0	+	2+	0	0	0	0	0	0	0
6		0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	0	+	0	+	0	+	2+	0	0	0	0	0	0	0
7		0	0	0	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	+	+	0	0	0	0	0	0	0	0
8		+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	0	0	+	0	+	3+	0	0	0	0	0	0	0
9		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	+	0	0	+	+	0	+	0	+	0	0	0	0	0	0	0	0
10		+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	0	+	0	+	0	+	0	+	2+	0	0	0	0	0	0	0
11		+	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	+	0	+	0	+	3+	0	0	0	0	0	0	0
Pt																														0	0	0	0	0	0	0	0

Panel Worksheet #1

Manuf.		ARC inhouse										Lot # 5432					Exp. Date 06/01/02																	
	Rh								Kell					Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS							
	D	C	E	c	e	f	V	1C ^w	K	k	Kk ^a	5Kk ^b	JJs ^a	5JJs ^b	1Fy ^a	3Fy ^b	1Jk ^a	3Jk ^b	3Le ^a	2Le ^b	3P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A				
	3	1	1	3	4	3		1	2	3	5	J	5	1	3	1	3	3	2	3		5		4	1	4		7	H					
																													G					
1	+	+	+	0	+	0	0	0	0	+	0	+	0	+	+	+	+	+	0	+	+	0	+	0	+	0	+	3+	0	0√				
2	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	+	+	0	+	0	+	0	+	0	+	0	+	0	0	0√			
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	0	0√				
4	0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	0	0	0	+	0	+	0	+	0	+	0	0	0√			
5	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0√				
6	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	+	0	+	2+	0	0	0√				
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	+	+	0	+	0	+	+	+	+	+	+	0	0	0√				
8	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0	0√				
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	+	0	+	0	+	0	+	0	0	0√			
10	+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	0	+	0	+	2+	0	0	0√			
11	+	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	0	+	3+	0	0	0√				
Pt																																0	0	0√

Panel Worksheet #1

Manuf.		ARC inhouse										Lot # 5432					Exp. Date 06/01/02															
		Rh							Kell					Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS					
		D	C	E	c	e	f	V	1 C ^w	K	k	K ^{no} ^a	5 K ^{no} ^b	J ^s ^a	5 J ^s ^b	1 Fy ^a	3 Fy ^b	1 Jk ^a	3 Jk ^b	3 Le ^a	2 Le ^b	3 P ₁	M	N	S	s	Lu ^a	Lu ^b	IS	3	A	
		3	1	1	3	4	3			2	3		5		5	1	3	1	3	3	2	3		5		4	1	4		7	H	
1		+	+	+	0	+	0	0	0	0	+	0	+	0	+	+	+	+	+	+	0	+	+	0	+	0	0	+	3+	0	0√	
2		+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	0	+	+	0	+	0	+	+	0	0	+	0	0	0√	
3		+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	+	0	0	+	0	0	0√	
4		0	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	0	0	0	+	+	0	0	+	0	0	0√	
5		0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	0	+	0	0	+	2+	0	0√	
6		0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	0	+	0	0	+	2+	0	0√	
7		0	0	0	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	+	0	0	0√	
8		+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	+	0	+	0	0	+	3+	0	0√	
9		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	+	0	0	+	+	0	0	+	0	0	0√	
10		+	+	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	0	+	0	+	0	0	+	2+	0	0√	
11		+	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	+	0	0	+	3+	0	0√	
Pt																												0	0	0√		

Exclusions

- Identified anti-M in serum
- Need to exclude anti-S
 - Need 1 M-S+s- cell or 2 M-S+s+ cells
 - Test this cell(s) using same method and same phases as initial panel
 - If no agglutination, anti-S is excluded
 - If agglutination, anti-S may be present

Multiple Antibodies

2+/2- Rule

- If anti-M and anti-S are present
 - To confirm anti-M
 - Need 2 cells M+S- to agglutinate
 - To confirm anti-S
 - Need 2 cells M-S+ to agglutinate
 - Need 2 cells M-S- to show no agglutination

Panel Worksheet #1

Manuf.		ARC inhouse										Lot # 5432					Exp. Date 06/01/02																
		Rh							Kell					Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS						
		D	C	E	c	e	f	V	1 ^{C_w}	2	3	K ^a	5 ^{K_b}	J ^{s_a}	5 ^{J_{s_b}}	1 ^{Fy^a}	3 ^{Fy^b}	1 ^{JK^a}	3 ^{JK^b}	3 ^{Le^a}	2 ^{Le^b}	3 ^{P₁}	M	N	S	s	Lu ^a	Lu ^b	IS	3	A		
		3	1	1	3	4	3																										
1		+	+	+	0	+	0	0	0	+	0	+	0	+	+	+	+	+	0	+	+	0	+	0	+	0	+	3+	0	0√			
2		+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	0	0	0√			
3		+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	0	0√			
4		0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	0	0	0	0	+	0	+	0	+	0	0	0√			
5		0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	0	+	+	+	+	0	+	0	+	0	+	2+	0	0√		
6		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	0	+	+	+	+	0	+	0	+	0	+	2+	0	0√		
7		0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	+	+	0	+	0	+	+	+	+	+	+	0	0	0√		
8		+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	0	0	+	+	0	+	0	+	0	+	3+	0	0√			
9		0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	0	0	0	+	0	+	0	+	0	0	0√			
10		+	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	0	+	+	0	+	0	+	2+	0	0√			
11		+	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	+	+	+	0	0	+	0	+	3+	0	0√			
Pt																												0	0	0√			

Antigen Typing

- Recipient's cells may be tested for M antigen
 - Expect to be M negative
- Controls for anti-M reagent
 - Cell for negative control---M-N+
 - Cell for positive control---M+N+

Panel Worksheet #2

Manuf.		ARC inhouse										Lot # 6089				Exp. Date 06/01/02																				
		Rh							Kell				Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS										
		D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	Kn ^b	J ^s _a	J ^s _b	Fy ^a	Fy ^b	JK ^a	JK ^b	Le ^a	Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	I	37	A	H	G			
																													S		G					
1		+	+	0	0	+	0	0	+	+	+	0	+	0	+	+	+	+	+	0	+	+	+	0	+	+	+	0	0	0	0	0	0	0	0	
2		+	+	0	0	+	0	0	0	0	+	0	+	0	+	+	0	+	0	0	+	+	+	+	0	0	+	0	0	0	0	0	0	0	0	
3		+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	+	+	0	+	0	2+	2+	2+	2+	2+	2+	2+
4		+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	0	0	0	+	0	+	0	+	0	+	0	0	0	0	0	0	0	0
5		0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	+	0	0	+	+	+	0	0	+	0	0	0	0	0	0	0	0
6		0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	0	+	0	1+	1+	1+	1+	1+	1+	1+
7		0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	0	0	0	0	0	0	0	0
8		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	0	+	+	0	+	0	0	+	0	0	0	0	0	0	0	0
9		0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	0	+	0	+	+	0	+	+	+	0	+	0	0	0	0	0	0	0	0
10		0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	+	+	+	0	+	0	+	0	0	0	0	0	0	0	0
11		+	+	0	0	+	0	0	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	+	+	0	+	0	0	0	0	0	0	0	0
Pt																												0	0	0	0	0	0	0	0	

Panel Worksheet #2

Manuf.	ARC inhouse										Lot # 6089					Exp. Date 06/01/02														
	Rh							Kell				Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS					
	D	C	E	c	e	f	V	--C ^w	K	k	Kn ^a	--Kn ^b	Js ^a	--Js ^b	Fy ^a	Fy ^b	JK ^a	JK ^b	Le ^a	--Le ^b	P ₁	M	N	S	S	Lu ^a	Lu ^b	I	37	A
	I	I							I															I	I		S		H	
																													G	
1	+	+	0	0	+	0	0	+	+	+	0	+	0	+	+	+	+	0	+	+	+	+	0	+	+	+	0	0	0√	
2	+	+	0	0	+	0	0	0	0	+	0	+	0	+	0	+	0	0	0	0	+	+	+	+	0	0	+	0	0	0√
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	+	0	0	0	0	0	+	+	0	+	0	2+	2+	
4	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	0	0	0	+	0	+	0	+	0	+	0	0	0√	
5	0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	0	0	+	+	+	0	0	+	0	0	0√
6	0	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	+	0	+	+	+	0	+	0	1+	1+	
7	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	0	0	+	0	+	+	0	+	+	+	0	0	0√	
8	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	0	0	+	+	0	+	0	0	+	0	0	0√	
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	0	+	0	+	+	0	+	0	+	0	+	0	0	0√	
10	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	+	+	+	0	+	0	+	0	0	0√	
11	+	+	0	0	+	0	0	0	0	+	0	+	0	+	0	0	+	+	0	+	+	+	+	+	0	+	0	0	0√	
Pt																											0	0	0√	

Panel Worksheet #2

Manuf.	ARC inhouse								Lot # 6089								Exp. Date 06/01/02																
	Rh								Kell				Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS							
	D	C	E	c	e	f	V	C ^w	K	k	Kn ^a	--Kn ^b	Js ^a	--Js ^b	--Fy ^a	Fy ^b	--Jk ^a	Jk ^b	Le ^a	--Le ^b	--P ₁	M	N	S	s	Lu ^a	Lu ^b	I	37	A	H	G	
	I	I			I			C		I														I			I	S					
1	+	+	0	0	+	0	0	+	+	+	0	+	0	+	+	+	+	+	0	+	+	+	+	0	+	+	+	0	0	0	0	0	√
2	+	+	0	0	+	0	0	0	0	+	0	+	0	+	+	0	+	0	0	+	+	+	+	0	0	+	0	0	0	0	0	√	
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	+	+	0	0	0	+	+	+	+	0	+	0	2+	2+			
4	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	+	0	0	0	+	0	+	0	+	0	+	0	0	0	0	√	
5	0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	+	0	0	+	+	+	0	0	+	0	0	0	0	√	
6	0	0	+	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	0	+	0	1+	1+			
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	0	0	0	0	√	
8	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	0	+	+	0	+	0	0	+	0	0	0	0	√	
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	0	+	0	+	+	0	+	+	0	+	0	0	0	0	√		
10	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	+	+	+	0	+	0	+	0	0	0	0	√	
11	+	+	0	0	+	0	0	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	+	+	0	+	0	0	0	0	√	
Pt																											0	0	0	0	0	√	

Panel Worksheet #2

Manuf.		ARC inhouse							Lot # 6089							Exp. Date 06/01/02														
	Rh								Kell					Duffy		Kidd		Lewis		P	MNS				Lutheran		Test Rxns LISS			
	D	C	E	c	e	f	V	1C ^w	K	k	Kn ^a	9Kn ^b	J ^s ^a	9Js ^b	2Fy ^a	3Fy ^b	4JK ^a	3JK ^b	3Le ^a	4Le ^b	7P ₁	M	N	S	S	Lu ^a	Lu ^b	I	37	A
	3	3		5	8	6	1		2	7							4	3	3	4		1	2	3	5	2	7	S		H
	3	3		5	8	6	1		2	7							4	3	3	4		1	2	3	5	2	7	S		G
1	+	+	0	0	+	0	0	+	+	+	0	+	0	+	+	+	+	0	+	+	+	+	0	+	+	+	0	0	0√	
2	+	+	0	0	+	0	0	0	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	0	+	0	0	0	0√	
3	+	0	+	+	0	0	0	0	0	+	0	+	0	+	0	+	+	0	0	0	+	+	+	+	0	+	0	2+	2+	
4	+	0	0	+	+	+	+	0	0	+	0	+	0	+	0	0	0	0	0	+	0	+	0	+	0	+	0	0	0√	
5	0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	+	0	0	+	+	+	0	0	+	0	0	0√	
6	0	0	+	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	+	0	+	+	+	0	+	0	1+	1+	
7	0	0	0	+	+	+	0	0	+	+	0	+	0	+	0	+	0	0	+	0	+	+	0	+	+	+	0	0	0√	
8	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	+	0	0	0	+	+	0	+	0	0	+	0	0	0√	
9	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	0	+	0	+	+	0	+	0	+	0	+	0	0	0√	
10	0	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	+	+	+	0	+	0	+	0	0	0√	
11	+	+	0	0	+	0	0	0	0	+	0	+	0	+	0	0	+	+	0	+	+	+	+	+	0	+	0	0	0√	
Pt																											0	0	0√	

Additional Testing

- If initial panel results are unclear
 - Test additional panels
 - Other enhancement techniques
 - Selected cell panels
 - Test cells antigen negative for the identified antibody
 - To identify/ exclude additional antibodies