

**ABID CASE #24**

Case Study by Jan Hamilton MT(ASCP)SBB and Jim Perkins, MD(©2009)



**History:** This 27 year old man with end stage renal disease has received multiple transfusions but none in the past 3 months. He recently moved here from another state.

**ABO and Rh Typing**

|    |    |          |         |        |    |        |     |        |
|----|----|----------|---------|--------|----|--------|-----|--------|
| <A | <B | A1 cells | B cells | 6% alb | <D | <D/AHG | CCC | Interp |
| 0  | 0  | 4+       | 4+      |        | 4+ |        |     |        |

**Antibody Screen**

|      |     |
|------|-----|
|      | Gel |
| SCI  | 3+  |
| SCII | 4+  |

**Direct Antiglobulin Test (tube method)**

|           |      |     |     |
|-----------|------|-----|-----|
|           | Poly | IgG | <C3 |
| AHG       | 0    |     |     |
| 5' incub. | 0    |     |     |
| CCC       | 3+   |     |     |

**Antibody screening cells phenotype**

| Lot #VSI69 |      | Rh system |   |   |   |   |   | Kell |   |                 |                 |                 |                 | Duffy           |                 | Kidd            |                 | Xg              | Lewis           |                 | MNSs |   |   |   | P  | Lutheran        |                 | Other   |     |    |
|------------|------|-----------|---|---|---|---|---|------|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------|---|---|---|----|-----------------|-----------------|---------|-----|----|
| Cell       | Rh   | D         | C | E | c | e | V | K    | k | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | JK <sup>a</sup> | JK <sup>b</sup> | Xg <sup>a</sup> | Le <sup>a</sup> | Le <sup>b</sup> | S    | s | M | N | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> | Typings | Gel |    |
| SCI        | R1R1 | +         | + | 0 | 0 | + | 0 | +    | + | 0               | +               | 0               | +               | +               | 0               | +               | +               | +               | 0               | +               | +    | + | + | + | +  | +s              | 0               | +       |     | 3+ |
| SCII       | R2R2 | +         | 0 | + | + | 0 | 0 | 0    | + | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | 0               | 0    | + | 0 | + | +  | 0               | +               |         | 4+  |    |

**Initial Panel**

| Lot #VRA112 |       | Rh system |   |   |   |   |   | Kell |   |                 |                 |                 |                 | Duffy           |                 | Kidd            |                 | Xg              | Lewis           |                 | MNSs |   |   |   | P  | Lutheran        |                 | Other   |                |      |    |
|-------------|-------|-----------|---|---|---|---|---|------|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------|---|---|---|----|-----------------|-----------------|---------|----------------|------|----|
| Cell        | Rh    | D         | C | E | c | e | V | K    | k | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | JK <sup>a</sup> | JK <sup>b</sup> | Xg <sup>a</sup> | Le <sup>a</sup> | Le <sup>b</sup> | S    | s | M | N | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> | Typings | Cell           | Gell |    |
| 1           | R1wR1 | +         | + | 0 | 0 | + | 0 | 0    | + | 0               | +               | 0               | +               | 0               | +               | +               | +               | +               | +               | 0               | 0    | + | 0 | + | +  | +               | 0               | +       | C <sup>w</sup> | 1    | 0  |
| 2           | R1R1  | +         | + | 0 | 0 | + | 0 | 0    | + | 0               | +               | 0               | +               | +               | +               | +               | 0               | +               | +               | 0               | 0    | + | 0 | + | 0  | +s              | 0               | +       |                | 2    | 0  |
| 3           | R2R2  | +         | 0 | + | + | 0 | 0 | 0    | + | 0               | +               | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | +    | + | + | 0 | +  | 0               | +               |         | 3              | 4+   |    |
| 4           | Ror   | +         | 0 | 0 | + | + | + | 0    | + | 0               | +               | 0               | +               | 0               | 0               | +               | +               | +               | 0               | +               | 0    | + | 0 | + | +  | 0               | +               |         | 4              | 2+   |    |
| 5           | r'r   | 0         | + | 0 | + | + | 0 | 0    | + | 0               | +               | 0               | +               | +               | 0               | +               | 0               | 0               | 0               | +               | 0    | + | 0 | + | 0  | 0               | +               |         | 5              | 2+   |    |
| 6           | r''r  | 0         | 0 | + | + | + | 0 | 0    | + | 0               | +               | 0               | +               | +               | 0               | +               | 0               | +               | +               | 0               | 0    | + | + | + | 0  | +               | 0               | +       |                | 6    | 3+ |
| 7           | rr    | 0         | 0 | 0 | + | + | 0 | +    | + | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | 0               | +    | + | + | + | 0  | 0               | +               |         | 7              | 3+   |    |
| 8           | rr    | 0         | 0 | 0 | + | + | 0 | 0    | + | 0               | +               | 0               | +               | 0               | +               | +               | +               | +               | 0               | +               | 0    | + | 0 | + | 0  | 0               | +               |         | 8              | 3+   |    |
| 9           | rr    | 0         | 0 | 0 | + | + | 0 | +    | + | 0               | +               | 0               | +               | +               | 0               | +               | +               | +               | 0               | 0               | +    | + | + | 0 | +  | 0               | +               |         | 9              | 3+   |    |
| 10          | rr    | 0         | 0 | 0 | + | + | 0 | 0    | + | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | 0               | +               | 0    | + | 0 | + | +  | +               | +               |         | 10             | 3+   |    |
| 11          | R1R1  | +         | + | 0 | 0 | + | 0 | +    | + | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | 0    | + | + | 0 | +  | 0               | +               |         | 11             | 3+   |    |
| Patient     |       |           |   |   |   |   |   |      |   |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |      |   |   |   |    |                 |                 |         |                | AC   |    |

**Question:**

1. What hypothesis can you make regarding what antibody or antibodies might be present? How would you investigate this?

**ABID CASE #15**

The technologist next tested 3 c-negative cells from the manufacturer's "confirmation" panel, and performed extended phenotyping on the patient's RBCs with the following results.

**Selected cells**

| Lot #VRB111 |       | Rh system |   |   |   |   | Kell |   |   |                 |                 |                 | Duffy           |                 | Kidd            |                 | Xg              | Lewis           |                 | MNSs            |   |   |   |   | P  | Lutheran        |                 | Other   |      |     |  |  |  |  |
|-------------|-------|-----------|---|---|---|---|------|---|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|---|---|----|-----------------|-----------------|---------|------|-----|--|--|--|--|
| Cell        | Rh    | D         | C | E | c | e | V    | K | k | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | JK <sup>a</sup> | JK <sup>b</sup> | Xg <sup>a</sup> | Le <sup>a</sup> | Le <sup>b</sup> | S | s | M | N | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> | Typings | Cell | Gel |  |  |  |  |
| 12          | rr    | 0         | 0 | 0 | + | + | 0    | + | + | 0               | +               | 0               | +               | +               | 0               | +               | +               | +               | 0               | +               | + | 0 | + | 0 | +  | 0               | +               |         | 12   |     |  |  |  |  |
| 13          | rr    | 0         | 0 | 0 | + | + | 0    | 0 | + | 0               | +               | 0               | +               | +               | 0               | +               | +               | +               | 0               | 0               | + | + | + | + | 0  | 0               | +               |         | 13   |     |  |  |  |  |
| 14          | rr    | 0         | 0 | 0 | + | + | 0    | 0 | + | 0               | +               | 0               | +               | +               | 0               | 0               | +               | +               | +               | 0               | + | + | + | 0 | +  | 0               | +               |         | 14   |     |  |  |  |  |
| 15          | R2R2  | +         | 0 | + | + | 0 | 0    | 0 | + | 0               | +               | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | + | + | + | + | +  | 0               | +               |         | 15   |     |  |  |  |  |
| 16          | R2R2  | +         | 0 | + | + | 0 | 0    | 0 | + | 0               | +               | 0               | +               | +               | 0               | +               | 0               | +               | 0               | +               | 0 | + | 0 | + | +  | 0               | +               |         | 16   |     |  |  |  |  |
| 17          | R2R2  | +         | 0 | + | + | 0 | 0    | 0 | + | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | + | + | + | + | +  | 0               | +               |         | 17   |     |  |  |  |  |
| 18          | R1wR1 | +         | + | 0 | 0 | + | 0    | 0 | + | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | +               | + | + | 0 | + | +  | 0               | +               |         | 18   | 0   |  |  |  |  |
| 19          | R1R1  | +         | + | 0 | 0 | + | 0    | 0 | + | 0               | +               | 0               | +               | +               | +               | 0               | +               | +               | 0               | +               | + | 0 | + | 0 | +  | 0               | +               |         | 19   | vw+ |  |  |  |  |
| 20          | RzR1  | +         | + | + | 0 | + | 0    | 0 | + | 0               | +               | 0               | +               | +               | 0               | +               | +               | +               | 0               | +               | 0 | + | + | + | 0  | 0               | +               |         | 20   | 3+  |  |  |  |  |
| 21          | r'r   | 0         | + | 0 | + | + | 0    | 0 | + | 0               | +               | 0               | +               | +               | 0               | +               | 0               | +               | 0               | +               | + | + | 0 | + | +  | 0               | +               |         | 21   |     |  |  |  |  |
| 22          | R1R2  | +         | + | + | + | + | 0    | + | 0 | 0               | +               | 0               | +               | +               | 0               | +               | +               | +               | 0               | +               | 0 | + | + | 0 | +  | +               | 0               | +       |      | 22  |  |  |  |  |
| Patient     |       |           |   |   |   |   |      |   |   |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |   |   |   |   |    |                 |                 |         | AC   |     |  |  |  |  |

**Antigen Phenotype**

| Antibody:   | Rh system |    |    |    | Kell |   |                 |                  |                  |                  | Duffy           |                 | Kidd            |                 | Lewis           |                 | MNSs            |   |   |    | p  |    |   |   |                |  |  |  |  |  |  |  |  |
|-------------|-----------|----|----|----|------|---|-----------------|------------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|----|----|----|---|---|----------------|--|--|--|--|--|--|--|--|
|             | C         | E  | c  | e  | K    | k | Kp <sup>a</sup> | Kp <sup>b*</sup> | Kp <sup>b*</sup> | Kp <sup>b*</sup> | Js <sup>a</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | JK <sup>a</sup> | JK <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M | N | S* | s* | P1 | I | H | A <sub>1</sub> |  |  |  |  |  |  |  |  |
| Patient     | 3+        | 0  | 0  | 3+ | 0    |   |                 |                  |                  |                  |                 | 0               | 2+              | 1+              | 0               |                 |                 |   |   |    |    |    |   |   |                |  |  |  |  |  |  |  |  |
| Pos control | 3+        | 3+ | 4+ | 3+ | 3+   |   |                 |                  |                  |                  |                 | 3+              | 2+              | 3+              | 2+              |                 |                 |   |   |    |    |    |   |   |                |  |  |  |  |  |  |  |  |
| Neg Control | 0         | 0  | 0  | 0  | 0    |   |                 |                  |                  |                  |                 | 0               | 0               | 0               | 0               |                 |                 |   |   |    |    |    |   |   |                |  |  |  |  |  |  |  |  |

2. Now which antibodies do you think are present? What alloantibodies cannot yet be excluded?

**ABID CASE #15**

Continuing with the problem the technologist selected and tested additional cells as follows.

**Selected cells**

| Cell | Rh    | Rh system |   |   |   |   |   | Kell |   |                 |      |                 |                 | Duffy           |                 | Kidd            |                 | Lewis           |                 | P  | MNSs |   |   |   |                 | Lutheran        |                 | Xg | Gel | Comment |
|------|-------|-----------|---|---|---|---|---|------|---|-----------------|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----|------|---|---|---|-----------------|-----------------|-----------------|----|-----|---------|
|      |       | D         | C | c | E | e | V | K    | k | Kp <sup>a</sup> | 30'' | Js <sup>a</sup> | Js <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | P1 | M    | N | S | s | Lu <sup>a</sup> | Lu <sup>b</sup> | Xg <sup>a</sup> |    |     |         |
| 1    | R1R1  | +         | + | 0 | 0 | + | 0 | +    | + | 0               | +    | 0               | +               | 0               | 0               | +               | +               | +               | 0               | +  | 0    | + | 0 | + | 0               | +               | 0               | 3+ |     |         |
| 2    | R1R1  | +         | + | 0 | 0 | + | 0 | 0    | + | 0               | +    | 0               | +               | 0               | +               | 0               | 0               | +               | +               | +  | +    | 0 | + | 0 | +               | +               | 0               |    |     |         |
| 3    | RzR1  | +         | + | 0 | + | + | 0 | 0    | + | 0               | +    | 0               | +               | 0               | +               | 0               | 0               | +               | +               | 0  | +    | 0 | + | 0 | +               | 0               | 4+              |    |     |         |
| 4    | R1R1  | +         | + | 0 | 0 | + | 0 | +    | + | 0               | +    | 0               | +               | 0               | +               | 0               | 0               | +               | 0               | +  | 0    | + | 0 | + | +               | 0               | 4+              |    |     |         |
| 5    | R2R2  | +         | 0 | + | + | 0 | 0 | 0    | + | 0               | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +  | 0    | + | 0 | + | 0               | +               | +               | 4+ |     |         |
| 6    | R1wR1 | +         | + | 0 | 0 | + | 0 | 0    | + | 0               | +    | 0               | +               | +               | 0               | +               | +               | 0               | 0               | +  | +    | + | 0 | 0 | +               | +               | w+              |    |     |         |
| 7    | R1R1  | +         | + | 0 | 0 | + | 0 | 0    | + | 0               | +    | 0               | +               | +               | 0               | +               | +               | 0               | +               | +  | 0    | + | 0 | 0 | +               | +               | w+              |    |     |         |
| 8    | RzR1  | +         | + | 0 | + | + | 0 | 0    | + | 0               | +    | 0               | +               | 0               | +               | 0               | 0               | +               | +               | +  | 0    | + | + | 0 | +               | 0               | 4+              |    |     |         |
| 9    | R1R1  | +         | + | 0 | 0 | + | 0 | +    | + | 0               | +    | 0               | +               | 0               | +               | 0               | 0               | +               | +               | +  | +    | + | 0 | 0 | +               | 0               | 4+              |    |     |         |
|      |       |           |   |   |   |   |   |      |   |                 |      |                 |                 |                 |                 |                 |                 |                 |                 |    |      |   |   |   |                 |                 |                 |    |     |         |
|      |       |           |   |   |   |   |   |      |   |                 |      |                 |                 |                 |                 |                 |                 |                 |                 |    |      |   |   |   |                 |                 |                 |    |     |         |
|      |       |           |   |   |   |   |   |      |   |                 |      |                 |                 |                 |                 |                 |                 |                 |                 |    |      |   |   |   |                 |                 |                 |    |     |         |
|      |       |           |   |   |   |   |   |      |   |                 |      |                 |                 |                 |                 |                 |                 |                 |                 |    |      |   |   |   |                 |                 |                 |    |     |         |

- What does this selected cell panel tell us? In the comment column of the antigram above indicate what each selected cell result tells us in terms of ruling-out (indicate "R/O") or ruling-in (indicate "R/I") one of the possible antibodies in this case. Taking all of the reactions together, what antibodies are proven? What cells are still needed to prove all of the antibodies? List their phenotypes and the reactions expected if your hypothesis is correct on the blank lines above.
  
- What percentage of donors is expected to be compatible with this recipient given the probable combination of antibodies present? Perform the calculation for European-American (E-A) and African-American (A-A) donors.