

## Immunoematology II

### Loma Linda University Pathology Residents

**Case 1:** 25 year old G2P1 female presents for routine prenatal testing at 28 weeks. Evaluate all parts of the case for discussion.

#### ABO/Rh Testing:

| Anti-A | Anti-B | Anti-D | Control | A1 cells | B cells |
|--------|--------|--------|---------|----------|---------|
| 4+     | 0      | 4+     | 0       | 2+       | 4+      |

#### Antibody Screen:

| Cell | Rh-hr | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 |                 | Kidd            |                 | Duffy           |                 | Lewis           |                 | MNS |   |   |   | P  |                 | Luth.           |   | Results |     |     |
|------|-------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|---|---|---|----|-----------------|-----------------|---|---------|-----|-----|
|      |       | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M   | N | S | s | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> |   | IS      | 37C | AHG |
| 1    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | +               | 0               | +               | 0               | +               | +               | +   | + | + | + | 0  | +               | 1               | 0 | 0       | 0   | ✓   |
| 2    | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | + | 0    | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | +               | 0   | + | 0 | + | 0  | +               | 2               | 0 | 2+      | 3+  |     |
| 3    | rr    | 0  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | 0               | +               | 0               | +   | 0 | + | 0 | 0  | +               | 3               | 0 | 2+      | 3+  |     |

#### Antibody ID:

| Cell | Rh-hr | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 |                 | Kidd            |                 | Duffy           |                 | Lewis           |                 | MNS |   |   |   | P  |                 | Luth.           |    | Results |     |     |
|------|-------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|---|---|---|----|-----------------|-----------------|----|---------|-----|-----|
|      |       | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M   | N | S | s | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> |    | IS      | 37C | AHG |
| 1    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | +   | + | + | 0 | 0  | +               | 1               | 0  | 0       | 0   | ✓   |
| 2    | rr    | 0  | 0 | 0 | + | + | + | 0              | + | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | +   | 0 | + | 0 | +  | 0               | +               | 2  | 0       | 2+  | 3+  |
| 3    | rr    | 0  | 0 | 0 | + | + | + | 0              | + | 0    | +               | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | 0               | +   | 0 | + | + | 0  | +               | 3               | 0  | 2+      | 3+  |     |
| 4    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | 0               | 0               | +               | 0               | +   | + | + | 0 | 0  | +               | 4               | 0  | 0       | 0   | ✓   |
| 5    | r'r   | 0  | 0 | + | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | 0               | +               | +               | +               | 0   | + | 0 | 0 | +  | 5               | 0               | 2+ | 3+      |     |     |
| 6    | r'r'  | 0  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | +               | +               | 0               | 0               | +               | +               | 0   | + | + | 0 | +  | 6               | 0               | 0  | 0       | ✓   |     |
| 7    | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | 0               | +               | 0               | +   | 0 | + | 0 | 0  | +               | 7               | 0  | 2+      | 3+  |     |
| 8    | rr    | 0  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | +               | 0               | +   | 0 | + | 0 | 0  | +               | 8               | 0  | 2+      | 3+  |     |
| 9    | R1r   | +  | + | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | +   | 0 | + | + | 0  | +               | 9               | 0  | 0       | 3+  |     |
| 10   | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | 0               | 0               | 0               | +   | + | + | + | 0  | +               | 10              | 0  | 2+      | 3+  |     |
| 11   | R0R0  | +  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | 0               | 0               | 0               | +               | 0   | + | 0 | 0 | +  | 0               | +               | 11 | 0       | 2+  | 3+  |
|      |       |    |   |   |   |   |   |                |   |      |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |     |   |   |   |    |                 | AC              | 0  | 0       | 0   | ✓   |

**Case 2:** 55 year old male pre-op for orthopedic surgery tomorrow following automobile accident 4 months ago. He received 3 units of RBCs at the time of the accident.

ABO/Rh Testing:

| Anti-A | Anti-B | Anti-D | Control | A1 cells | B cells |
|--------|--------|--------|---------|----------|---------|
| 0      | 4+     | 3+     | 0       | 4+       | 0       |

Antibody Screen:

| Cell | Rh-hr | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 |                 | Kidd            |                 | Duffy           |                 | Lewis           |                 | MNS |   |   |   | P  |                 | Luth.           |   | Results |  |  |  |
|------|-------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|---|---|---|----|-----------------|-----------------|---|---------|--|--|--|
|      |       | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M   | N | S | s | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> |   | GEL     |  |  |  |
| 1    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | +               | +               | 0               | +               | 0               | +               | +   | + | + | + | +  | 0               | +               | 1 | 0       |  |  |  |
| 2    | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | +               | +   | 0 | + | 0 | +  | 0               | +               | 2 | 1+      |  |  |  |

Antibody ID:

| Cell | Rh-hr | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 |                 | Kidd            |                 | Duffy           |                 | Lewis           |                 | MNS |   |   |   | P  |                 | Luth.           |    | Results |    |       |  |
|------|-------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|---|---|---|----|-----------------|-----------------|----|---------|----|-------|--|
|      |       | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M   | N | S | s | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> |    | GEL     |    | Ficin |  |
| 1    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | +               | +   | + | + | 0 | 0  | +               | 1               | 0  |         | 0  |       |  |
| 2    | rr    | 0  | 0 | 0 | + | + | + | 0              | + | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | +   | 0 | + | 0 | +  | 0               | +               | 2  | 0       |    | 0     |  |
| 3    | rr    | 0  | 0 | 0 | + | + | + | 0              | + | 0    | +               | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | 0               | +   | 0 | + | + | 0  | +               | 3               | 0  |         | 0  |       |  |
| 4    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | 0   | + | + | 0 | 0  | +               | 4               | 0  |         | 0  |       |  |
| 5    | r'r   | 0  | 0 | + | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | +               | +   | 0 | + | 0 | 0  | +               | 5               | 0  |         | 1+ |       |  |
| 6    | r'r   | 0  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | +   | 0 | + | + | 0  | +               | 6               | 0  |         | 0  |       |  |
| 7    | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | +               | 0   | + | 0 | 0 | +  | 7               | 1+              |    | 2+      |    |       |  |
| 8    | rr    | 0  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | +               | +   | 0 | + | 0 | +  | 0               | +               | 8  | 0       |    | 0     |  |
| 9    | R1r   | +  | + | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | +               | 0               | +   | + | 0 | + | 0  | +               | 9               | 0  |         | 0  |       |  |
| 10   | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | 0               | +   | + | + | + | 0  | +               | 10              | 1+ |         | 2+ |       |  |
| 11   | R0R0  | +  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | 0               | 0               | 0               | +               | 0   | + | 0 | 0 | +  | 0               | +               | 11 | 0       |    | 0     |  |
|      |       |    |   |   |   |   |   |                |   |      |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |     |   |   |   |    |                 |                 | AC | 0       |    | 0     |  |

**Case 3:** 45 year old male with Crohn's Disease and history of multiple previous surgeries and transfusions (most recent transfusion 2 years ago, at another facility). Type and cross for 2 units ordered.

ABO/Rh Testing:

| Anti-A | Anti-B | Anti-D | Control | A1 cells | B cells |
|--------|--------|--------|---------|----------|---------|
| 0      | 0      | 3+     | 0       | 4+       | 4+      |

Antibody Screen:

| Cell | Rh-ir | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 |                 | Kidd            | Duffy           |                 | Lewis           |                 | MNS             |   |   |   | P | Luth. |                 | Results         |        |         |    |    |  |  |  |
|------|-------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|---|---|-------|-----------------|-----------------|--------|---------|----|----|--|--|--|
|      |       | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M | N | S | s | P1    | Lu <sup>a</sup> | Lu <sup>b</sup> | PEG IS | PEG IAT |    |    |  |  |  |
| 1    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | 0               | + | + | + | + | +     | 0               | +               | +      | 1       | 0  | 0✓ |  |  |  |
| 2    | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | + | 0 | + | 0 | +     | 0               | +               | +      | 2       | 2+ |    |  |  |  |

Antibody ID:

| Cell | Rh-ir            | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 |                 | Kidd            | Duffy           |                 | Lewis           |                 | MNS             |   |   |   | P | Luth. |                 | Results         |        |         |    |  |  |  |
|------|------------------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|---|---|-------|-----------------|-----------------|--------|---------|----|--|--|--|
|      |                  | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M | N | S | s | P1    | Lu <sup>a</sup> | Lu <sup>b</sup> | PEG IS | PEG IAT |    |  |  |  |
| 1    | R1R1             | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | +               | + | + | + | 0 | 0     | +               | 1               | 0      | 0✓      |    |  |  |  |
| 2    | rr               | 0  | 0 | 0 | + | + | + | 0              | + | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | + | 0 | + | 0 | +     | 0               | +               | 2      | 0       | w+ |  |  |  |
| 3    | rr               | 0  | 0 | 0 | + | + | + | 0              | + | 0    | +               | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | 0               | + | 0 | + | + | 0     | +               | 3               | 0      | 0✓      |    |  |  |  |
| 4    | R1R1             | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | 0 | + | + | 0 | 0     | +               | 4               | 0      | 0✓      |    |  |  |  |
| 5    | r <sup>+</sup> r | 0  | 0 | + | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | +               | + | 0 | + | 0 | 0     | +               | 5               | 0      | 1+      |    |  |  |  |
| 6    | r'r'             | 0  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | + | 0 | + | + | 0     | +               | 6               | 0      | 0✓      |    |  |  |  |
| 7    | R2R2             | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | +               | 0 | + | 0 | + | 0     | 0               | +               | 7      | 0       | 2+ |  |  |  |
| 8    | rr               | 0  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0 | + | 0 | + | 0     | +               | 8               | 0      | 0✓      |    |  |  |  |
| 9    | R1r              | +  | + | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | + | 0 | + | + | 0     | +               | 9               | 0      | w+      |    |  |  |  |
| 10   | R2R2             | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | 0               | 0               | 0               | + | + | + | + | 0     | +               | 10              | 0      | 2+      |    |  |  |  |
| 11   | R0R0             | +  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | 0               | 0               | 0               | +               | 0 | + | 0 | 0 | +     | 0               | +               | 11     | 0       | 0✓ |  |  |  |
|      |                  |    |   |   |   |   |   |                |   |      |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |   |   |   |   |       |                 |                 | AC     | 0       | 0✓ |  |  |  |

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Case 3 (continued)

| Cell | Rh-ir            | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 |                 | Kidd            |                 | Duffy           |                 | Lewis           |                 | MNS |   |   |   | P  | Luth.           |                 | Results   |           |    |  |  |
|------|------------------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|---|---|---|----|-----------------|-----------------|-----------|-----------|----|--|--|
|      |                  | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M   | N | S | s | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> | Ficin 37C | Ficin IAT |    |  |  |
| 1    | R1R1             | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | 0               | +               | 0               | +               | +   | + | + | 0 | 0  | +               | 1               | 0         | 0         | 0✓ |  |  |
| 2    | rr               | 0  | 0 | 0 | + | + | + | 0              | + | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | 0   | + | 0 | + | 0  | +               | 2               | 0         | 2+        |    |  |  |
| 3    | rr               | 0  | 0 | 0 | + | + | + | 0              | + | 0    | 0               | +               | 0               | +               | 0               | +               | 0               | 0               | 0               | 0               | +   | 0 | + | + | 0  | +               | 3               | 0         | 0✓        |    |  |  |
| 4    | R1R1             | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | 0   | + | + | 0 | 0  | +               | 4               | 0         | 1+        |    |  |  |
| 5    | r <sup>+</sup> r | 0  | 0 | + | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | 0               | +               | +               | +               | 0   | + | + | 0 | 0  | +               | 5               | 1+        | 2+        |    |  |  |
| 6    | r'r'             | 0  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | +   | 0 | + | + | 0  | +               | 6               | 0         | 1+        |    |  |  |
| 7    | R2R2             | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | +               | 0   | + | 0 | + | 0  | 0               | 7               | 2+        | 3+        |    |  |  |
| 8    | rr               | 0  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +   | 0 | + | 0 | +  | 0               | 8               | 0         | 0✓        |    |  |  |
| 9    | R1r              | +  | + | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | +               | 0               | +   | + | 0 | + | +  | 0               | 9               | 0         | 2+        |    |  |  |
| 10   | R2R2             | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | 0               | +   | + | + | + | 0  | +               | 10              | 2+        | 3+        |    |  |  |
| 11   | R0R0             | +  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | +               | 0               | +   | 0 | 0 | + | 0  | +               | 11              | 0         | 2+        |    |  |  |
|      |                  |    |   |   |   |   |   |                |   |      |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |     |   |   |   |    |                 | AC              | 0         | 0✓        |    |  |  |

**Case 4:** 69-year-old female admitted for right hemicolectomy due to recently diagnosed colon cancer. G3P3 pregnancy history. No previous transfusions.

ABO/Rh Testing:

| Anti-A | Anti-B | Anti-D | Control | A1 cells | B cells |
|--------|--------|--------|---------|----------|---------|
| 4+     | 0      | 0      | 0       | 0        | 4+      |

Antibody Screen:

| Cell | Rh-hr | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 | Kidd            |                 | Duffy           |                 | Lewis           |                 | MNS             |   |   |   | P |    | Luth.           |                 | Results |    |  |  |
|------|-------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|---|---|----|-----------------|-----------------|---------|----|--|--|
|      |       | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M | N | S | s | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> |         | SP |  |  |
| 1    | R1R1  | +  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | 0               | +               | 0               | +               | 0               | +               | + | + | + | + | 0  | +               | 1               | 2+      |    |  |  |
| 2    | R2R2  | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0 | + | 0 | + | 0  | +               | 2               | 1+      |    |  |  |

Antibody ID:

| Cell | Rh-hr                         | Rh |   |   |   |   |   |                |   | Kell |                 |                 |                 | Kidd            |                 | Duffy           |                 | Lewis           |                 | MNS             |   |   |   | P |    | Luth.           |                 | Results |    |  |  |
|------|-------------------------------|----|---|---|---|---|---|----------------|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|---|---|----|-----------------|-----------------|---------|----|--|--|
|      |                               | D  | C | E | c | e | f | C <sup>w</sup> | K | k    | Kp <sup>a</sup> | Kp <sup>b</sup> | Js <sup>a</sup> | Js <sup>b</sup> | Jk <sup>a</sup> | Jk <sup>b</sup> | Fy <sup>a</sup> | Fy <sup>b</sup> | Le <sup>a</sup> | Le <sup>b</sup> | M | N | S | s | P1 | Lu <sup>a</sup> | Lu <sup>b</sup> |         | SP |  |  |
| 1    | R1R1                          | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | 0               | +               | 0               | +               | + | + | + | 0 | 0  | +               | 1               | 2+      |    |  |  |
| 2    | rr                            | 0  | 0 | 0 | + | + | + | 0              | + | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0 | + | 0 | + | 0  | +               | 2               | 1+      |    |  |  |
| 3    | rr                            | 0  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | + | 0 | + | + | 0  | +               | 3               | 0       |    |  |  |
| 4    | R1R1                          | +  | + | 0 | 0 | + | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | 0 | + | + | 0 | 0  | +               | 4               | 2+      |    |  |  |
| 5    | r <sup>1</sup> r              | 0  | 0 | + | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | 0               | +               | +               | 0               | +               | +               | + | 0 | + | 0 | 0  | +               | 5               | 0       |    |  |  |
| 6    | r <sup>1</sup> r <sup>2</sup> | 0  | + | 0 | 0 | + | 0 | 0              | + | +    | 0               | +               | 0               | +               | +               | +               | +               | 0               | 0               | +               | + | 0 | + | + | 0  | +               | 6               | 1+      |    |  |  |
| 7    | R2R2                          | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | +               | 0 | + | 0 | 0 | +  | 7               | 2+              |         |    |  |  |
| 8    | rr                            | 0  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | +               | 0               | + | 0 | + | 0 | +  | 8               | 0               |         |    |  |  |
| 9    | R1r                           | +  | + | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | +               | +               | 0               | +               | + | 0 | + | + | 0  | +               | 9               | 1+      |    |  |  |
| 10   | R2R2                          | +  | 0 | + | + | 0 | 0 | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | +               | 0               | 0               | + | + | + | + | 0  | +               | 10              | 2+      |    |  |  |
| 11   | R0R0                          | +  | 0 | 0 | + | + | + | 0              | 0 | +    | 0               | +               | 0               | +               | +               | 0               | 0               | 0               | +               | 0               | + | 0 | 0 | + | 0  | +               | 11              | 2+      |    |  |  |
|      |                               |    |   |   |   |   |   |                |   |      |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |   |   |   |   |    |                 | AC              | 0       |    |  |  |