

## **ABID CASE #2, ANSWERS**

Case study by Jim Perkins, M.D. (© 2008)

1. What is the probable identity of this antibody?

*Alloanti-E*

2. Is any further workup needed to prove it?

*No; if you include the antibody screening cell (in 2 and 3 cell screening panels cell #2 typically has the phenotype DcE) there are 3 E positive cells reactive, 3 non-reactive cells, the patient is E negative, and the appropriate antibodies are ruled out (anti-D, -C, -c, -e, -K, -k, -Fy<sup>a</sup>, -Fy<sup>b</sup>, -Jk<sup>a</sup>, -Jk<sup>b</sup>, -Le<sup>a</sup>, -Le<sup>b</sup>, -S, -s, -M, -N, and -P1)*

3. What is the probable source of the immunizing stimulus in this case?

*Fetal maternal hemorrhage*

4. Does this antibody cause hemolytic transfusion reactions?

*Yes, both immediate and delayed. Anti-E is a common cause of DHTRs.*

5. Does this antibody cause hemolytic disease of the fetus and newborn?

*Yes.*

6. How would we select compatible blood for this patient? What percentage of donors are expected to be compatible with this recipient?

*In the US we would select group A or O, Rh negative, E negative RBCs, compatible in an indirect antiglobulin test crossmatch. Overall 70% of Caucasian donors are E negative, but virtually all Rh neg donors are E negative as well.*

7. What is the biochemical nature of the antigen? (Review the outline of the features of the relevant blood group system.)

*The E antigen is carried by the RHCE protein, a multi-pass membrane protein which also carries the C/c polymorphism. RHCE is highly homologous to the RHD protein, to which it is closely linked genetically. All Rh antigens are protease and sulfhydryl reducing agent resistant, and agglutination by Rh antibodies is typically enhanced by protease treatment of RBCs. The RhD and RhCE proteins are associated with the RBC "skeleton", and Rh<sub>null</sub> cells lacking both proteins have abnormal morphology. They also may function as transporters, possibly for ammonium ion. The Rh blood group system includes many other high- and low-frequency antigens. Single and multiple Rh system antibodies are among the most common encountered in all populations.*