TECHNICAL CASE #15, ANSWERS:
Case study by Jim Perkins, M.D. (©2009)

Indian Immunohematology Initiative

1. What is the probable identity of this antibody?

   Anti-E

2. Is any further workup needed to prove it?

   No; if you include the reactive antibody screening cell and the cell that reacted in the second (PEG/tube) panel 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^a, -Fy^b, -Jk^a, -Jk^b, -Le^a, -Le^b, -S, -s, -M, -N, -P1)

3. Why doesn't the antibody react with all cells carrying the corresponding antigen? What is this phenomenon called? Why do you suppose the technologist chose to try the PEG/tube technique for the second panel?

   This patient's serum reacts only with cells carrying a "double-dose" (homozygous expression) of the E antigen. Such cells are more easily agglutinated by this weak anti-E because there is a greater density of the E antigen on their surface. This is called the "dosage phenomenon", and the serum is said to "show dosage".

   This antibody was weakly reactive showing dosage. The technologist may have used PEG enhancement on the possibility that a single dose E+ cell (r''r) would react. Individual weak antibodies may react better by the PEG/tube method than in gel (or solid phase) or vice versa. Regardless, there are 3 E+ cells reacting so the antibody specificity was demonstrated as outlined above.

4. Does this antibody cause hemolytic transfusion reactions? (Hint: if the patient was transfused 3 weeks earlier, why isn't there a mixed field typing for C and/or E showing transfused cells of the common Rh phenotypes R1 or R2.)

   Anti-E causes both immediate and delayed hemolytic transfusion reactions (IHTRs and DHTRs respectively), and in our laboratory is a common cause of DHTRs. In fact, this patient appears to have had a DHTR. The antibody detection test was negative 3 weeks ago but is now positive suggesting that at least one of the transfused units was E positive and caused an anamnestic reaction producing anti-E. But the DAT and E antigen typing test are both negative, consistent with elimination of the E positive transfused cells.

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 is expected to be compatible with this recipient?

   We would select group B or O, Rh positive, E negative RBCs, compatible in an indirect antiglobulin test crossmatch. Overall 70% of Caucasian donors are E negative.