

Blaney: Basic and Applied Concepts of Immunohematology, 2nd Edition

Test Bank

Chapter 2: Blood Banking Reagents: Overview and Applications in Immunohematology

MULTIPLE CHOICE

1. Select the test that uses IgG-sensitized red cells (check cells).
 - a. Antiglobulin test
 - b. D-antigen typing
 - c. Rh-antigen typing
 - d. B-antigen detection

ANS: A

The antiglobulin test requires the use of IgG-sensitized cells to verify that a negative reaction was not caused by improper washing, omitting the antiglobulin reagent, or reagent problems.

DIF: Level 1

2. Select the method that uses a dextran-acrylamide matrix.
 - a. Solid-phase red cell adherence
 - b. Microplate
 - c. Gel technology
 - d. Tube techniques

ANS: C

The dextran-acrylamide gel matrix traps agglutinated cells, making antigen-antibody reactions visible.

DIF: Level 1

3. What reagent contains antibodies to multiple antigenic epitopes?
 - a. Polyclonal-based
 - b. Monoclonal-based
 - c. Heterophile antibody-based
 - d. Alloantibody-based

ANS: A

Polyclonal reagents contain antibodies to more than one antigen specificity.

DIF: Level 1

4. The evidence for reagent red cell deterioration may include which of the following?

- a. Spontaneous agglutination
- b. Significant hemolysis
- c. Loss of agglutination strength over time
- d. All of the above

ANS: D

Each observation listed may indicate a reagent red cell problem that could lead to false reactions.

DIF: Level 2

5. Reagent antibodies prepared from human sources are:
- a. unsafe.
 - b. too low of potency to be effective.
 - c. polyclonal in specificity.
 - d. preferred because of their lower cost.

ANS: C

Human-derived antisera have antibodies to more than one specificity and meet Food and Drug Administration guidelines for potency and safety.

DIF: Level 1

6. Monoclonal antibodies are prepared in:
- a. vitro.
 - b. vivo.
 - c. laboratory animals.
 - d. humans.

ANS: A

Monoclonal antibodies are prepared from antibody-producing B lymphocytes and myeloma cells in a hybridoma.

DIF: Level 1

7. An advantage of using a monoclonal antibody over a polyclonal antibody includes all of the following *except*:
- a. very few variations between lots.
 - b. no contaminating antibodies.
 - c. direct agglutination is usually faster.
 - d. all variations of the antigen can be detected.

ANS: D

Antigen variations, such as the partial D phenotype, may be missed by some monoclonal D antibodies.

DIF: Level 2

8. Product limitations and technical considerations for each reagent can be found in the:
- standard operating procedure.
 - product insert.
 - Food and Drug Administration code of regulations.
 - AABB standards.

ANS: B

The product insert outlines the technical considerations, procedural guidelines, and product limitations for each reagent.

DIF: Level 1

9. Solid-phase red cell adherence used for antibody detection has an advantage over tube testing because:
- there is no washing involved.
 - incubation time is not necessary.
 - the endpoint is more clearly defined.
 - indicator cells (IgG-coated cells) are not necessary.

ANS: C

Well-defined endpoints make reading results more consistent and reliable.

DIF: Level 2

10. Which of the following statements is true regarding IgG-sensitized red cells?
- They must be used to confirm a negative antiglobulin tube test.
 - They must be used to confirm a positive antiglobulin test.
 - They must be used to confirm a direct antiglobulin test that was negative with anti-C3d.
 - They should be used only with the indirect antiglobulin test.

ANS: A

IgG-sensitized red cells are used as a control for false-negative antiglobulin tests.

DIF: Level 2

11. The gel technology method uses a concentration of red cells that is:
- higher than tube techniques.
 - lower than tube techniques.
 - the same as the 3% to 5% requirement for tube testing.
 - variable according to the test performed.

ANS: B

The gel method uses a 0.8% suspension of red cells.

DIF: Level 1

12. The antiglobulin test was performed using gel technology. A button of cells was observed at the bottom of the microtube following centrifugation. This result indicates a:
- problem with the card.
 - negative reaction.
 - strong positive reaction.
 - failure to wash correctly.

ANS: B

Red cells that are not trapped by the antihuman globulin reagent will travel unimpeded through the length of the tube.

DIF: Level 3

13. Which of the following statements is true regarding high-protein anti-D reagents?
- They have been largely replaced with low protein monoclonal reagents.
 - They contain approximately 20% bovine albumin.
 - They may increase the possibility of a false-positive reaction, requiring the use of a control.
 - All of the above are true.

ANS: D

High-protein anti-D reagent requires the use of a control to verify that positive reactions are the result of an antigen-antibody reaction and not agglutination caused by the reagent additive. For this reason, the use of monoclonal anti-D is more commonly used.

DIF: Level 2

14. How would you interpret the results if both the anti-D reagent and the Rh control were 2+ agglutination reactions?
- D-positive
 - D-negative
 - Unable to determine without further testing
 - Depends on whether the sample was from a patient or a blood donor

ANS: C

The Rh control should be negative for the test to be valid.

DIF: Level 2

15. Which red cells are used to screen for antibodies in donor samples?
- Screening cells (two vials)
 - Pooled screening cells
 - Panel cells
 - Screening cells (three vials)

ANS: B

Pooled screening cells are acceptable for screening antibodies in donor samples.

DIF: Level 1

16. Polyspecific antihuman globulin contains:
- anti-IgG.
 - anti-C3b and anti-C3d.
 - anti-IgG, and anti-C3d.
 - anti-IgG, and anti-IgM.

ANS: C

Polyspecific antihuman globulin contains specificities to the heavy chain IgG and complement component, C3d.

DIF: Level 1

17. The indirect antihuman globulin test is incubated at what temperature?
- 22° C
 - 37° C
 - 4° C
 - 56° C

ANS: B

Incubation takes place at body temperature, which is 37° C.

DIF: Level 1

18. Why is incubation omitted in the direct antihuman globulin test?
- The direct antiglobulin test can be used in an emergency to replace the indirect test.
 - Incubation will cause hemolysis.
 - The antigen-antibody complex has already formed in vivo.
 - IgM antibodies are detected in the direct antiglobulin test.

ANS: C

Incubation of the antigen-antibody complex essentially has taken place within the patient (or donor), making additional incubation in the tube unnecessary.

DIF: Level 2

19. In the solid-phase red cell adherence test, a negative test would appear as:
- a button of cells on the bottom of the well.
 - adherence of cells along the sides and bottom of the wells.
 - hemolysis of red cells.
 - a line of cells along the top of the well.

ANS: A

Indicator cells added in the final step that do not adhere to the wells have not reacted with the antibody and therefore will form a button on the bottom of the well.

DIF: Level 1

20. Following centrifugation of the gel card, red cells are observed to be evenly dispersed throughout one of the microtubes. This reaction could be graded as a:
- 4+.
 - 3+.
 - 2+.
 - 1+.

ANS: C

A 2+ reaction is demonstrated with red cells throughout the microtube.

DIF: Level 2

MATCHING

Select the reagent from the list below and match it to the routine blood banking procedure.

- Panel cells
 - Screening cells
 - A₁ and B cells
 - ABO antisera
 - Rh antisera
 - Lectins
- Reagent derived from plants used to distinguish group A₁ from group A₂ red cells
 - Reagent used to determine the ABO antigenic composition of a patient's red cells
 - Reagent to detect the presence of red cell antibodies
 - Reagent to identify the specificity of a red cell antibody
 - Reagent used in the identification of ABO antibodies

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|-----------|--------------|
| 1. ANS: F | DIF: Level 2 |
| 2. ANS: D | DIF: Level 2 |
| 3. ANS: B | DIF: Level 2 |
| 4. ANS: A | DIF: Level 2 |
| 5. ANS: C | DIF: Level 2 |