

## **Mononucleosis Testing**

### **Objectives:**

1. Follow instructions of the reagent package insert(s) to select, and evaluate appropriate specimens for Mononucleosis testing.
2. Perform the mononucleosis kit test(s) for the detection of antibodies to obtain control and patient results that match instructor values with 100% accuracy.
3. Evaluate reagent package inserts to determine the substance being analyzed, the principle of the procedure, the expected value, significance of abnormal results, limitations of the procedure, and troubleshooting procedures to follow if / when control results are unacceptable.
4. Appropriately record and report results as instructed.
5. Utilize lecture notes, textbook and laboratory (including product inserts) information to answer study questions.

### **Introduction:**

Infectious mononucleosis (IM) is an acute or subacute benign infectious lymphoproliferative disease that is associated with the Epstein-Barr virus (EBV) of Burkitt's lymphoma. The disease most often affects children and young adults and is characterized by an increase in atypical lymphocytes, enlargement of the lymph nodes and spleen, fever and production of characteristic heterophile antibodies. Clinical, serologic and hematologic factors must all be considered together to arrive at a diagnosis of IM.

Serological testing for mononucleosis became available as a result of the research of Paul and Bunnell on heterophile antibodies. Heterophile antibodies are those that will react (cross react) with any member of a group of similar antigens that can be found in unrelated animals or microorganisms. The antigens (called heterophile antigens) are so similar that an antibody built to one will cross react with the others. Paul and Bunnell noted that during the course of infectious mononucleosis, patients developed heterophile antibodies which were capable of agglutinating erythrocytes from sheep and horses. Davidsohn modified the original Paul-Bunnell test by adding steps to absorb out cross reacting Forssman and serum sickness antibodies leaving behind the IM heterophile antibody to react with sheep red cells. Their adaptation, the Davidsohn Differential test, became the classical reference method for laboratory diagnosis of infectious mononucleosis, however it is time consuming and awkward to perform.

Recent researchers have developed tests for infectious mononucleosis heterophile antibodies using treated horse or bovine red cells, or extracted antigens from bovine RBCs that have been attached to latex particles or coated in tubes for enzyme-linked immunoassay testing (EIA).

### **Principle:**

**Review the principle of the specific kit being used in this laboratory.**

**Materials:**

1. Mononucleosis testing kit(s).
2. Patient and control serum specimens.
3. Timer
4. Other materials as directed by reagent product insert(s).

**Procedure:**

See specific reagent product insert(s).

**Interpretation:**

See specific reagent product insert(s).

**Expected Results:**

1. Consult the reagent product insert(s) for interpretation.
2. As with all tests for heterophile antibodies, false positive and negative results do occur, but usually in low numbers (@ 1%).
3. Detectable heterophile antibody level may be observed as early as four days, but more commonly requires three weeks or more. Some persons, especially young children, will not produce observable heterophile antibody levels although clinical and hematological signs are evident.
4. Positive test results may persist even though clinical symptoms are absent.

**Precautions:**

1. Follow manufacturer's directions exactly (unless directed by instructor).
2. Reagents and specimens must be at room temperature.
3. **Review the product insert the specific kit(s) being used in this laboratory for additional information.**

**Laboratory 12: Mononucleosis Testing**  
Results and Study Questions

Name \_\_\_\_\_

Date \_\_\_\_\_

Test Kit Name \_\_\_\_\_

Manufacturer \_\_\_\_\_

Lot Number \_\_\_\_\_

Expiration Date \_\_\_\_\_

When reporting results, first indicate what you saw (i.e. agglut / no agglut), then state the interpretation (i.e. positive or negative).

Patient Name and Identification Number	Result
1.	
2.	
Controls	
Positive	
Negative	

Using your textbook, lecture and lab results and notes, answer the following questions. Each question is worth one point, unless otherwise indicated.

1. Based on the control results, can these patient results be reported?  
**Yes No** (circle one) If not, explain why.
2. What is the carrier particle in the indicator / test system (to what substance is the antigens physically attached)?
3. What specimens may be tested by this procedure?
4. State at least three conditions which may cause positive results for heterophile antibodies. (1.5 points)
5. What is the genus and species which is the causative agent of infectious mononucleosis?
6. What factors must be considered before a diagnosis of IM can be made? (1.5 points)
7. After reviewing the product insert state the **principle** of this test kit including the appearance of positive and negative reactions. (In your own words, please.)