

C - Reactive Protein (CRP) Testing by latex agglutination

Objectives:

1. Follow instructions of the reagent package inserts to select, and evaluate appropriate specimens for rheumatoid factor testing.
2. Perform latex agglutination tests for the detection of CRP 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 insert) information to answer study questions.

Introduction:

Serum from patients with pneumococcal pneumonia (*Mycoplasma pneumoniae*) possess a protein that specifically reacts with the C-polysaccharide of the pneumococcus. Upon electrophoresis, this group of three proteins migrate to an area between the Beta and Gamma regions. They are considered to among the 'acute phase proteins' whose concentrations increase in a non-specific response to inflammation and cellular necrosis.

C-Reactive Protein (CRP) is manufactured by the liver and released into the plasma during many necrotic, inflammatory or infectious diseases including myocardial infarction (MI), active rheumatic fever, and pneumococcal pneumonia. CRP disappears rapidly from the blood after recovery from disease and is not present in the serum from healthy people. The presence of CRP in a patient with MI or rheumatic fever is considered to be the most sensitive indicator of necrosis and inflammation.

CRP detection is considered to be of greater practical significance than all other indices of inflammation in assessing inflammatory diseases. CRP is present at all times when the erythrocyte sedimentation rate (ESR) is abnormally elevated whereas ESR determinations may be borderline and may, in some cases, remain elevated in the absence of inflammation. CRP results, unlike ESR, are not influenced by anemia or altered serum proteins. Although it is not diagnosis of any particular disease, the level of CRP in serum indicates the intensity of the disease, the response of the patient to treatment, and can be used to monitor patient progress.

Principle: (general overview)

When latex particles complexed human anti-CRP are mixed with a patient's serum containing C - reactive proteins, an agglutination reaction will take place.

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

Materials:

1. C - Reactive Protein test kit(s).
2. Patient and control serum specimens.
3. Timer
4. Other materials as directed by reagent product insert(s).

Procedure:

See reagent product insert(s).

Interpretation:

Agglutination of latex particles is considered a positive reaction, indicating the presence of C - reactive protein at a significant and detectable level. Specimens which do not contain human CRP will not cause agglutination. Consult the reagent product insert(s) for specific information.

Expected Results:

Consult the reagent product insert(s) for interpretation.

Limitations:

1. Specimens with markedly high CRP may demonstrate postzone (antigen excess) effect. Therefore, some manufacturer's recommend diluting the specimen prior to testing. Consult product literature.
2. A quantitative titration procedure on positive specimens is required to observe increasing or decreasing levels. Consult product literature.
3. Patients with high titers of rheumatoid factors may give positive results. It is recommended that patients suspected with RA be tested for presence of rheumatoid factors.
4. Procedure must be followed carefully and results read at the appropriate time. Reading after the specified time may result in mis-interpretation due to drying of specimen/reagents.
5. Avoid contamination of reagent or reagent dispensing dropper.

Laboratory 7: C - Reactive Protein Testing by latex agglutination
Results and Study Questions

Name _____

Date _____

Test Kit Name _____

Manufacturer _____

Lot Number _____

Expiration Date _____

State the interpretation as “positive” or “negative”.

Patient Name and Identification Number	Result		
	Undiluted (if required)	Diluted (if required)	Final 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? (circle one) **Yes** **No**
If “no”, explain why.

2. According to the product insert, what does the presence of CRP indicate?

3. What are the latex particles coated with?

(1.5 pts) 3. State three (3) advantages that the the CRP test has over ESR.

4. Why do most manufacturers recommend testing specimens diluted and undiluted?

5. According to the criteria discussed in class, would a *false negative* reaction due to increased levels of CRP be considered prozone, zone of equivalence, or postzone?

(2 pts) 6. 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.)