

Alternative Complement Activation Pathway Functional Assay

HEMOLYTIC RADIAL IMMUNODIFFUSION ASSAY OF THE FUNCTIONAL ACTIVITY OF ALTERNATIVE COMPLEMENT PATHWAY IN SERUM

Test Highlights

- This test measures the functional ability of the alternative complement pathway to lyse chicken erythrocytes embedded in agarose gel.

Clinical Background

The alternative complement pathway is a cascade of reactions leading to lysis of cell membranes and cell death. Deficiencies of factors within this pathway contribute to recurrent infections and autoimmune diseases.

Pathophysiology

- The complement system consists of plasma enzymes, regulatory proteins, and proteins activated in a cascading fashion.
- The alternative pathway is activated by complex polysaccharides, including endotoxin.
- Bacterial lipopolysaccharides, virus components, and other pathogens have the ability to activate the alternative pathway.
- Deficiency of C3 component is seen in systemic lupus erythematosus (SLE), pyogenic infections, and glomerulonephritis.
- Deficiencies of factor D, properdin, and membrane attack complex are associated with increased susceptibility to infection, particularly due to *Neisseria spp.* species.
- Alternative pathway activation begins with the breakdown of C3 by C3 convertase (C3b and factor B), which is stabilized by properdin.
- C3 cleavage results in the subsequent activation of C5, C6, C7, C8, and C9 and formation of the membrane attack complex that binds to the surface of the target, leading to lysis and local inflammation.
- Intermediate components of complement activation C3a and C5a function as anaphylotoxins. C5a is also a major chemo-attractant for neutrophils and macrophages to the site of activation.

Indication for Ordering

Screening for functional ability of the alternative pathway of the complement system.

Additional Ordering Note

If the test result is abnormal, order specific tests for evaluation of individual components of the alternative pathway.

Interpretation

Test result below reference interval can occur due to hereditary absence or acquired functional activity of any of the individual components of the alternative pathway.

Limitations

- Test does not evaluate individual components of the alternative pathway.
- Rare complement activation can occur during blood draw.

Methodology

Radial immunodiffusion method measuring functional ability of the alternative complement pathway to lyse chicken erythrocytes embedded in agarose gel.

Related Tests

- Complement Activity Enzyme Immunoassay, Total (0050198)
- Complement Factor Bb (2003042)
- Complement Component 2 (0050150)
- Complement Component 3 (0050150)
- Complement Component 4 (0050155)
- Complement Component 4A (2003180)
- Complement Component 5 (0050156)
- Complement Component 6 (0099072)
- Mannose Binding Lectin (0051692)
- Complement Factor B (0051720)

References

1. Walport MJ. Complement. First of two parts. *N Eng J Med* 2001;344:1058–66.
2. Walport MJ. Complement. Second of two parts. *N Eng J Med* 2001;344:1140–4.
3. Thurman JM, Holers VM. The central role of the alternative complement pathway in human disease. *J Immunol* 2006;176:1305.
4. Wen L, Atkinson JP, Giclas PC. Clinical and laboratory evaluation of complement deficiency. *J Allergy Clin Immunol* 2004;113:585.
5. Glovsky MM, Ward PA, Johnson KJ. Complement determinations in human disease. *Ann Allergy Asthma Immunol* 2004;93(6):513–22.

Test Information

2005373

Complement Activity, Alternative Pathway (AH50)

For specific collection, transport, and testing information, refer to the ARUP website at www.aruplab.com.

For information on test selection, ordering, and interpretation, refer to ARUP Consult® at www.arupconsult.com.

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