

CLINICAL SPECIFICATIONS

CYTOSKELETAL PROTEINS

Function:

Cytoskeletal Proteins is the collective name given to intercellular adherent junctions that are involved in the integrity and functionality of the epithelial barrier. The major cytoskeletal proteins assessed in Array 22 are α -actinin, talin and vinculin. Alpha-actinin forms a lattice-like structure and stabilizes the muscle contractile, additionally α -actinin associates with signaling molecules. Talin is found in focal adhesions where it links the transmembrane receptors, integrins, to the actomyosin network and either directly or indirectly interacts with α -actinin and vinculin. Vinculin is a cytoskeletal protein associated with cell-cell and cell-matrix junctions.

Associated With:

D-IBS^{1,2}
 Chronic inflammatory demyelinating polyneuropathy³
 Chronic functional bowel changes⁴

Known Cross-Reactions: Alpha-actinin with anti-ssDNA⁵

Clinical Significance:

Antibodies to Cytoskeletal Proteins (α -actinin, talin, vinculin) may indicate intestinal barrier breakdown. A common mechanism of cytoskeletal breakdown is the infiltration of intestinal cells by bacterial cytolethal distending toxin-B (CdtB). Increased intestinal permeability to large macromolecules is a common consequence of mucosal inflammation, production of proinflammatory cytokines that disturb body homeostasis and enhanced exposure to environmental triggers including the external pathogens.⁶ The broken barrier and entry of environmental antigens into the bloodstream, through the transcellular route, may trigger autoimmune reactivity, which can lead to autoimmune disease.⁷ If antibodies to Bacterial Cytotoxins are elevated in conjunction with Cytoskeletal Proteins, it may indicate irritable bowel syndrome with diarrhea (D-IBS) with small intestinal bacterial overgrowth (SIBO).^{1,4}

This array tests for IgG, IgA and IgM separately. Equivocal or out-of-range results indicate heightened antibody reactivity to the tested antigen. We tested 120 blood donor sera against Cytoskeletal Proteins at optimal dilution, 12% of these donors were IgG reactive; 15% of these donors were IgM reactive; 16.5% of these donors were IgA reactive.

References:

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2. Schmulson et al. Clinical experience with the use of anti-CdtB and anti-vinculin antibodies in patients with diarrhea in Mexico. Revista de Gastroenterología de México. 2016; 81(4):236-239.
3. Beppu et al. Autoantibodies against vinculin in patients with chronic inflammatory demyelinating polyneuropathy. J Neuroimmunol. 2015; 287:9-15.
4. Pimental et al. Autoimmunity links vinculin to the pathophysiology of chronic functional bowel changes following *Campylobacter jejuni* infection in a rat model. Dig Dis Sci, 2015; 60:1195-1205.
5. Renaudineau et al. Anti-alpha-actinin antibodies cross-react with anti-ssDNA antibodies in active autoimmune hepatitis. Clin Rev Allergy Immunol, 2008; 34(3):321-325.
6. Ivanov et al. Cytoskeletal regulation of epithelial barrier function during inflammation. Am J Pathol, 2010; 177(2):512-524.
7. Fasano. Leaky gut and autoimmune diseases. Clin Rev Allerg Immunol, 2011; 42(1):71-78.