

## CLINICAL SPECIFICATIONS

### LIPOPOLYSACCHARIDE

#### Function:

Lipopolysaccharide (LPS) is a molecule made up of a lipid and a polysaccharide. LPS is a component of the surface membrane of gram-negative bacteria found in the gastrointestinal tract. Gram-negative bacteria include: *Escherichia coli*, *Salmonella*, *Shigella*, *Pseudomonas*, *Helicobacter*, *Legionella*, *Wolbachia*. As an endotoxin, LPS increases the negative charge of the bacterial membrane and promotes the upregulation of pro-inflammatory cytokines.<sup>1, 6</sup>

#### Antibodies Appear:

Chronic fatigue syndrome<sup>2</sup>  
 Gram-negative bacterial infection<sup>4</sup>  
 Increase intestinal permeability<sup>1, 2</sup>  
 Major depression<sup>1</sup>  
 Miller Fisher syndrome<sup>3</sup>  
 Short bowel syndrome<sup>3</sup>

**Known Cross-Reactions:** DNA-histone,<sup>5</sup> Ganglioside,<sup>3</sup> Amyloid-beta peptide<sup>7</sup>

#### Clinical Significance:

Lipopolysaccharides (LPS) is a bacterial endotoxin that elicits a strong immune response.<sup>4</sup> The detection of antibodies against LPS indicates infiltration of macromolecule-sized endotoxins into the intestinal barrier and the systemic circulation. For better clinical evaluations, LPS should be measured in conjunction with antibodies against tight junction proteins, occludin/zonulin, and epithelial structure proteins from the actomyosin network. If antibodies to LPS alone are elevated while antibody levels for occludin/zonulin and actomyosin are negative, the patient may have gut flora dysbiosis. When both LPS and occludin/zonulin antibodies are positive and actomyosin antibody is not detected, there is likely a breakdown in intestinal barrier integrity caused by infiltration of bacterial antigens through the paracellular pathway. Results showing elevations in LPS and actomyosin antibody levels, but not in occludin/zonulin, indicate a high possibility of breakdown in the intestinal barrier integrity by bacterial antigens through the transcellular pathway.

#### References:

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