

## CLINICAL SPECIFICATIONS

# ESCHERICHIA COLI CDT + SALMONELLA CDT

### Function:

*Escherichia coli* (*E. coli*) and *Salmonella* are bacteria found in the gastrointestinal tract. These bacteria release a cytotoxin called cytolethal distending toxin (CDT). CDTs can infiltrate intestinal epithelial cells, damage tissue proteins, attack the cell's nucleus and contribute to a breakdown of the intestinal barrier.

### Associated With:

Irritable bowels<sup>1</sup>  
 D-IBS<sup>1</sup>  
 SIBO<sup>1,2</sup>  
 Gut dysbiosis<sup>1</sup>  
 Chronic functional bowel changes<sup>2</sup>

**Known Cross-Reactions:** A $\beta_{42}$  peptide;<sup>3</sup> Inositol polyphosphate 5-phosphatase;<sup>4</sup> deoxyribonuclease-1 (DNase-1)<sup>5</sup>

### Clinical Significance:

*E. coli* and *Salmonella* are members of the bacteria group that participates in diseases that involve the disruption of a mucosal or epithelial layer.<sup>6</sup> By producing cytotoxins, these bacteria affect the delicate environment of the small intestine, and then gain entry into the cell, where by binding to the cellular DNA, they induce apoptosis. They find their way to the submucosa, regional lymph nodes, and into circulation, where the immune system responds by producing antibodies against them. The gut microbiome has been linked to the development of Alzheimer's disease (AD).<sup>7-9</sup> The cytolethal distending toxins from *E. coli* and *Salmonella* were shown to have high cross-reactivity with amyloid beta (A $\beta_{42}$ ) peptide, much higher than antibodies against the organisms as a whole and the lipopolysaccharides from each organism.<sup>3</sup> Studies have shown that Gram-negative bacteria as *E. coli* and *Salmonella typhosa* can be found in amyloid deposits. <sup>reviewed in 3</sup> Due the reactivity of A $\beta_{42}$  peptide with *E. coli* and *Salmonella*,<sup>3</sup> patients with circulating antibodies to *E. coli* and *Salmonella* CDTs may be at greater risk for AD and other neurological disorders when the blood-brain barrier is breached.

### References:

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