

## CLINICAL SPECIFICATIONS

### ORAL PATHOGENS

#### Function:

*Streptococcus sanguinis* (*S. sanguinis*) is a commensal organism found in a healthy mouth. During dental work, *S. sanguinis* may gain entrance to the bloodstream. A gram-positive bacterium, *Streptococcus mutans* (*S. mutans*) is a known oral cavity pathogen. It may play a role in dental caries.

#### Associated With:

Dental caries-active<sup>1</sup>  
Behçet's disease<sup>2</sup>  
Psoriasis<sup>3</sup>  
Rheumatoid arthritis<sup>4</sup>  
Cardiovascular disorders<sup>5,6</sup>

**Known Cross-Reactions:** *S. sanguinis* with collagen;<sup>7</sup> Human intraocular peptide Brn-3b;<sup>2</sup> A $\beta$ <sub>42</sub> peptide<sup>8</sup>  
*S. mutans* with Heart tissue;<sup>5,9</sup> Myosin<sup>6</sup>

#### Clinical Significance:

An association between oral pathogens and Alzheimer's disease has been shown in different studies.<sup>10,11</sup> Streptococci oral pathogens have been shown to play a role in internal disorders, notably Alzheimer's disease (AD) and cardiovascular disorders. *S. mutans* is most successful in the internalization of glucose, galactose, mannose, GlcNAc, and GlcN.<sup>12</sup> This allows *S. mutans* to out-compete other members of the oral microbiome and thus thrive in the host.<sup>12</sup> *S. sanguinis* and *S. mutans* are both capable of eliciting potent inflammatory cytokine responses, including interferon- $\gamma$ , interleukin-4 and interleukin-10.<sup>13,14</sup> Inflammatory cytokines lead to autoimmunity as seen in the pathogenesis of AD, psoriasis and autoimmune cardiovascular disorders. Cross-sectional studies show that chronic periodontitis increases the risk for AD; although the mechanism is unknown, it is suspected that the chronic low-grade systemic inflammation associated with periodontal disease may be the cause.<sup>10, reviewed in 11</sup> Vojdani et al. showed that anti-amyloid beta (A $\beta$ <sub>42</sub>) reacted with the extracts of oral pathogens, including *S. sanguinis* and *S. mutans*.<sup>14</sup> Due to cross-reactivity with amyloid beta peptide,<sup>8</sup> patients with circulating antibodies to oral pathogens may be at greater risk for AD and other neurological disorders when the blood-brain barrier is breached.

#### References:

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