

Can Probiotics **stop** Periodontal Disease?

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Periodontal disease is probably the main cause of tooth loss in adults. As dentists we have all seen cases of periodontal disease that run rampant and are not able to be controlled despite our best efforts, and even despite the best efforts of the patients.

Could it be that as dentists we are only treating the obvious destruction of the disease, and not doing enough to prevent the disease from re-taking a foothold in the oral cavity in the first place.

WHAT CAUSES PERIODONTAL DISEASE

Recently researchers at the University of Maryland Medical Center published findings linking periodontal disease to autoimmunity in October 2010. This explains why some people are affected by periodontal disease more than others.

In periodontal disease, certain anaerobic bacteria cause the buildup of plaque and calculus, which in turn allow the release of toxins. These toxins stimulate our immune system to produce a group of proteins known as cytokines. Cytokines modulate and influence the immune response, and thus determine the level of severity of periodontal disease in each individual.

Currently our efforts as dentists are at keeping plaque and calculus to a minimum by thorough scaling

every 6 months and reducing gingival pockets to a cleanable depth where periodontal destruction has already occurred. This is sometimes supplemented with the use of antibacterial mouthwash such as Chlorhexidine to help control the pathogenic bacteria.

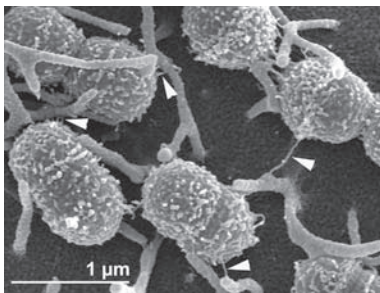
Of course there is merit to this approach, but what if we were to add in another level of defense and try to control directly the release of the pro-inflammatory cytokines that cause destructive periodontal disease.

CURRENT RESEARCH

A recent poster paper presented at the IADR from the University of Western Ontario in Canada ¹ has shown that certain probiotic strains may be able to do just that, influence the levels of pro-inflammatory cytokine production.

They tested specific periodontitis causing bacteria *Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans* and *Fusobacterium nucleatum* and how they affected human gingival fibroblasts. All three of these pathogenic bacteria are implicated in periodontal disease and all three were able to stimulate the release of cytokines IL-6 and IL-8, which have been shown to be pro-inflammatory cytokines that stimulate destructive periodontitis.

When the probiotic *Streptococcus salivarius K12* was added to this bacterial model, the amount of cytokine release was greatly reduced after 8 hours. This strongly suggests that *S.salivarius K12* was able



The picture above shows spheres of *S.salivarius K12* bacteria attaching to a human cell (the black area beneath). The arrows point to the attachments.

Through this mechanism, the BLIS K12 bacteria can down regulate cytokine release.

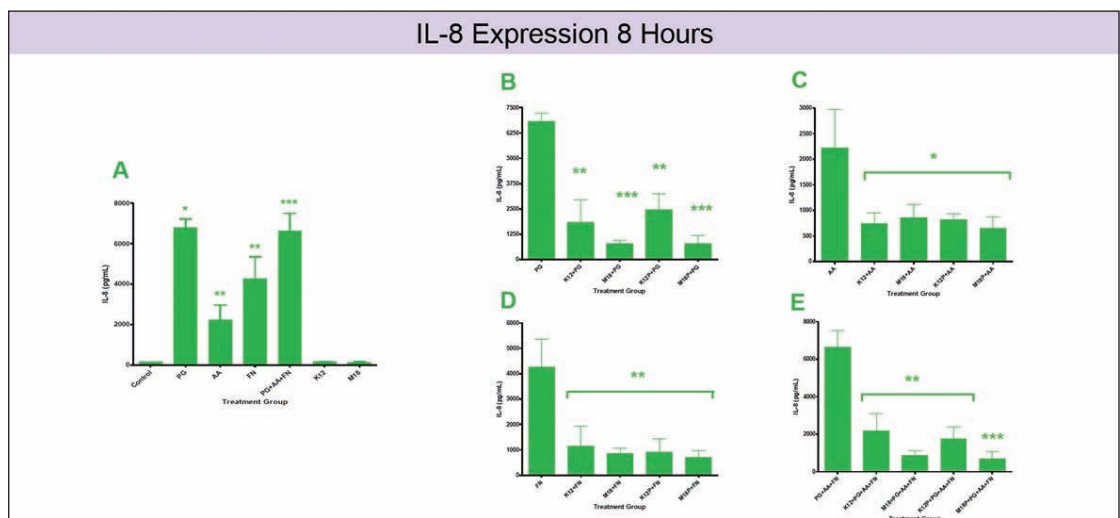


Fig. 4. IL-8 expression at 8 hours. (A) All pathogenic bacteria induced more IL-8 production at 8 hours than K12 and M18, or no bacteria. Probiotics significantly reduced IL-8 production in cells challenged with PG (B), AA (C), FN (D), and all three pathogens simultaneously (E). Statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (N=3).

to dramatically down regulate the cytokine release from the pathogenic bacteria. So it is surmised that *S.salivarius K12* may in turn be able to reduce the destructiveness of periodontal disease. This was also shown to be the case when tested in other cell types.

MORE ABOUT PROBIOTIC K12

S.salivarius K12 or BLIS K12 does not only operate by blocking potential pathogens as many probiotics do. It acts in five distinct and separate ways some of which provide attributes for potentially modifying disease states:

1. **BLIS K12 competes with other mouth bacteria** for space and nutrients and in this way; acts to maintain a healthy balance of oral bacteria.
2. **BLIS K12 secretes anti microbial proteins** called Salivaricins A & B, which can inhibit undesirable bacteria, making it more effective at fighting off pathogens such as *P.gingivalis* and *F.nucleatum*.

It is these two features of BLIS K12 that we currently use to help control a person's Halitosis

3. **BLIS K12 stimulates the body's own defences** by communicating with certain cells in the mouth, causing

them to produce interferon gamma, an immune biomarker, known to contribute to non-specific immunity against many intracellular bacteria and viruses.

4. **BLIS K12 down-regulates pro-inflammatory cytokine release** that happens in such diseases as periodontal disease. **BLIS K12 produces enzymes** such as urease, which regulates pH, enzymes such as detranase, which may degrade components of plaque.

MY CURRENT TREATMENT PROTOCOL

The loss of teeth is a psychological and financial burden that should be prevented at all costs. As dentists we know that good oral hygiene is sufficient for most of our patients, but unfortunately not all. As well as this most of our patients do not practice good hygiene every day due to the various stresses of life.

I therefore place all of my patients on a preventive program that tackles all areas of the mouth that are of a concern.

1. Using non-foaming toothpaste and tongue gels to clean the mouth and limit the number of pathogenic bacteria and the biofilms they live in.
2. Using mild alkaline mouthwashes

twice a week to maintain a neutral mouth environment and avoid the acid attack that comes from every day living.

3. Using floss to clean the gingival pockets and prevent their colonization with pathogenic periodontal bacteria.
4. And finally taking a dose of Oral Probiotics to down regulate any cytokine release occurring from bacteria and toxins that form in plaque and tartar we failed to clean away.

Taking a daily dose of BLIS K12 Probiotics not only will increase the effectiveness of any preventative program but it will also provide a buffer zone for patients that may not be as efficient in their cleaning as they should be. ♦

For more information about BLIS K12 please contact Dr. Speiser directly on 1300-653-335

References

1. Streptococcus salivarius K12 and M18 Probiotics Reduce Periodontal Pathogeninduced Inflammation
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