

# Preventing periodontal disease

Oral health is an essential part of our overall health and well-being. Poor oral hygiene can lead to periodontal disease, one of the most common human diseases. Periodontal pathogens, besides affecting oral health, can have systemic impact thus influencing our well-being<sup>1,2</sup>. Our mouth is the gateway to overall health. That is why it is important to take oral care beyond brushing and flossing.

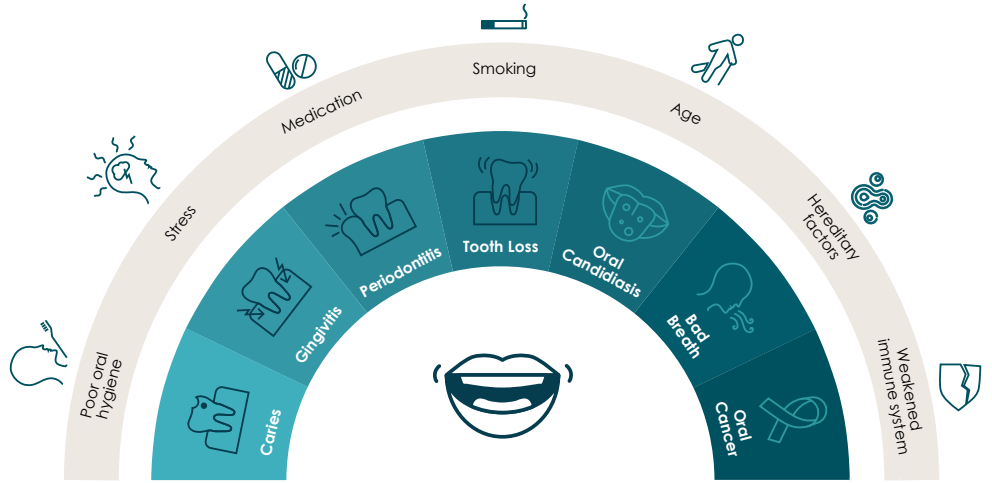


Figure 1: Risk factors for oral disease

The oral microbiota is estimated to harbour between 700 and 1,000 bacterial species<sup>2</sup>. This includes species belonging to the *Streptococcus*, *Veillonella*, *Neisseria*, and *Actinomyces* genera, which most healthy individuals share<sup>3,4</sup>. However, the oral microbiota can be easily disturbed by poor oral hygiene and lifestyle choices [figure 1].

Disturbances of the oral microbiota can result in various oral diseases, including gingivitis, periodontitis, dental caries, halitosis and even

oral cancer<sup>5</sup>. As the mouth is the primary gateway to the body, changes in the oral microbiota that lead to various oral diseases can also have a huge impact on our general health. Periodontal pathogens can have systemic impact promoting the development of a variety of non-communicable diseases, such as cardiovascular disease, rheumatoid arthritis, cancer, inflammatory bowel disease, diabetes, and Alzheimer’s disease. These pathogens can even lead to adverse pregnancy outcomes<sup>1,2,5</sup>. However, the oral

microbiota has a bi-directional effect. Not only oral microbiota changes can lead to systemic inflammation, thus causing non-communicable diseases, but certain diseases can also directly affect the composition of the oral microbiota.

Given the role of the oral microbiota in the development of disease, there is an opportunity for targeted probiotic formulations in optimizing our oral health and long term well-being.

## Strain selection

The probiotic strains in Winlove Smile have been specifically selected to inhibit the growth of oral pathogens and biofilm formation and to stimulate IL-10 production, which plays a crucial role in reducing inflammation.

The probiotic strains have been screened *in vitro* for their capacity to:

- Inhibit pathogens associated with the development of periodontal disease, without stimulating *S. mutans*
- Inhibit biofilm formation
- Adhesion to epithelial cells
- Stimulate IL-10 production

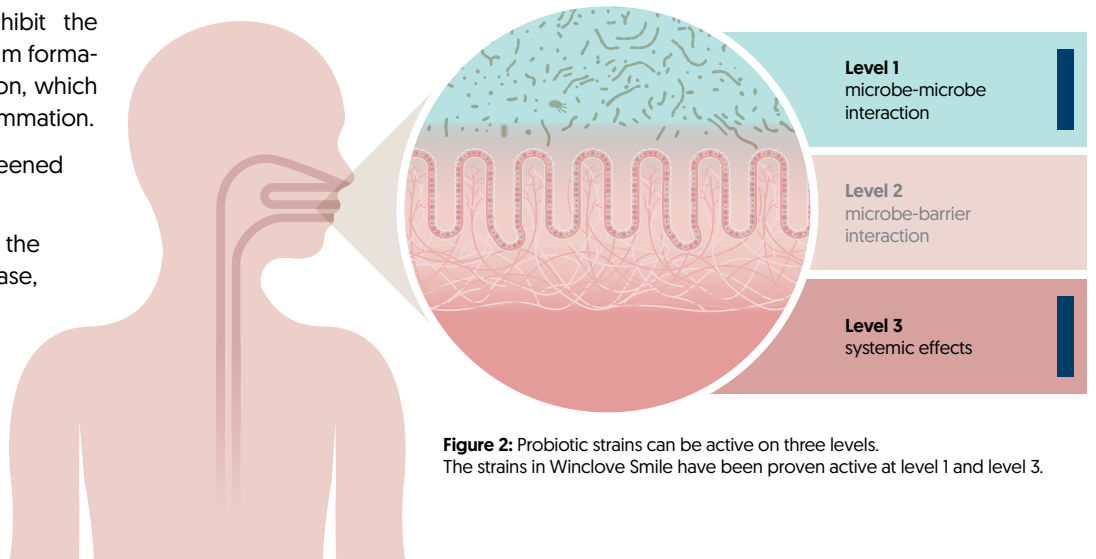


Figure 2: Probiotic strains can be active on three levels. The strains in Winlove Smile have been proven active at level 1 and level 3.

## In vitro evidence

It has been shown *in vitro* that the strains in Winlove Smile are able to inhibit pathogens associated with development of periodontal disease such as *Aggregatibacter actinomycetemcomitans*, *Fusobacterium nucleatum*, *Porphyromonas gingivalis* and *Prevotella intermedia*<sup>6</sup>, with a growth reduction between 50%-90%. In addition, the strains do not stimulate the growth of *S. mutans* (the major patho-

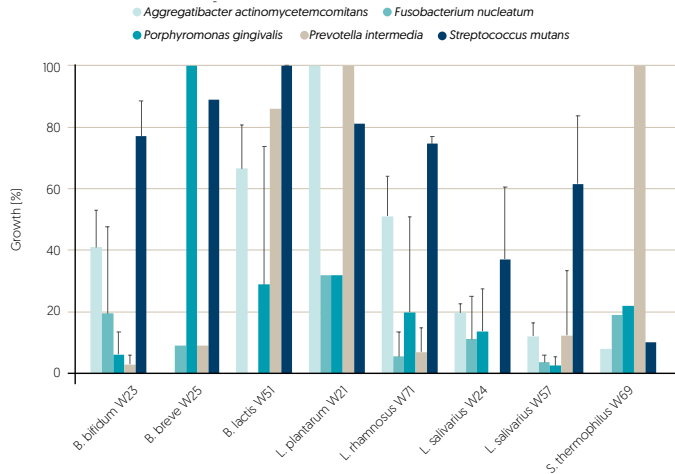
gen involved in the development of caries). We wanted to avoid inadvertently stimulating *S. mutans* by inhibiting pathogens that cause periodontal disease [Figure 3].

Another important factor in the development of periodontal disease is the formation of biofilms, also known as dental plaque. All the strains in Winlove Smile were capable of diminishing biofilm formation between 40% -

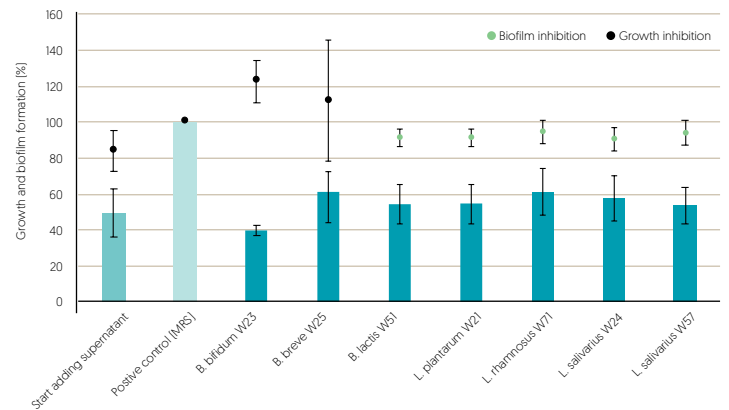
60% in an *in vitro* model with antibiotic vancomycin-resistant *Enterococcus faecium* (VRE), [Figure 4].

Finally the strains in Winlove Smile showed strong adhesive capacity to CaCo2 and HT29 epithelial cells and stimulated IL-10 production, which plays a role in reducing (gum) inflammation (data not shown).

**Figure 3.** Inhibition of pathogens by the various strains in Winlove Smile. Data is presented as percentage of growth compared to control (no inhibition).



**Figure 4.** Effects of cell-free supernatants of the probiotic strains in Winlove Smile on growth of vancomycin-resistant *E. faecium* E470 and biofilm formation after overnight incubation. Supernatants that had an effect on both the biofilm and the growth are depicted with a green dot.



## Formulation details

Indication	Preventing periodontal disease			
Colony forming units (cfu)	2.5 x 10 <sup>9</sup> cfu/gram.			
Bacterial strains and active ingredients	<i>B. bifidum</i> W23 <i>B. breve</i> W25	<i>B. lactis</i> W51 <i>L. plantarum</i> W21	<i>L. rhamnosus</i> W71 <i>L. salivarius</i> W24	<i>L. salivarius</i> W57 <i>S. thermophilus</i> W69
PROBIOACT® Technology	Carefully selected ingredients that contribute to stability (shelf-life), GI-survival and metabolic activity of the probiotic strains.			
Recommended daily dosage	1 gram, twice daily.			
Recommended use	Dissolve the recommended dose in approximately 25 ml of lukewarm water. Leave for 1 minute, stir gently before rinsing for 30 seconds, and swallow. Preferably on an empty stomach: before breakfast and/or at bedtime.			
Treatment period	For as long as desired/needed.			
Storage and stability	24 months stable at room temperature, no refrigeration needed.			
Available dosage forms	Dry powder which can be supplied as bulk, sachets, or fully packed (with your design).			
Safety and Quality Profile	All probiotic strains have the Qualified Presumption of Safety (QPS) status. Winlove is an NSF International Certified GMP Facility for manufacturing dietary supplements and is ISO 22000:2005 certified for the development and production of prebiotics -and probiotics.			
Marketing	Private label.			

## References

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