

What the science tells us - Oral Panel References

Observation of oral micro-biota is a major indicator for the occurrence, development, and prognosis of disease.

Consequently, these potential biomarkers of disease, the proverbial 'canary of the coal mine in human disease' could be used to warn dentists or physicians of disease yet-to-come or to assess risk of disease. Thus, for the dentist, oral medicine specialist, or periodontist, these warning 'danger' microbial profiles would allow for early treatment to combat disease in the preclinical stages. The oral microbiome could be used further to monitor health status after treatment, that is, "Is the treatment working to establish a more healthy microbial profile?" Regardless of the specific application, microbial analysis is in an exciting phase of research with huge prospects for the clinic. ([SOURCE](#))

Periodontitis is one of the most frequent infections in humans and is often recognized as the leading cause of tooth loss in adults. It can lead to oral and potentially systemic disabilities. Recent epidemiological data from the Global Burden of Disease (GBD) 2010 study suggest that periodontitis is the sixth-most prevalent condition in the world. In the mouth, various types of tissues, growth conditions and nutrients are encountered in the development of different communities. Indeed, some bacteria are much more prevalent in some environments of the oral cavity than in others because they find ideal conditions to survive. For instance, the microbiota of the saliva resembles that of the tongue and differs significantly from that present on teeth and root surfaces. ([SOURCE](#))

According to Gao et al. (2018), there are approximately 700 species in the oral cavity which must be in balance in order to prevent oral and systemic disease. The human oral microbiome database (HOMD) provides the sequencing for over 600 16S RNA. ([SOURCE](#))

Periodontal diseases affect the supporting tissues of teeth. The most common, gingivitis and periodontitis, are inflammatory diseases that are induced and maintained by the polymicrobial biofilm (dental plaque) that are formed on teeth in the absence of daily oral hygiene procedures. While gingivitis is a reversible inflammatory response without loss of bone support, periodontitis

includes the destruction of the periodontal attachment and the alveolar bone. Peri-implantitis is the term used for a similar inflammatory reaction as periodontitis, but around dental implants, also here including the loss of bone support. Periodontitis is the result of a complex interplay between microorganisms of the dental biofilm and the host. The role of specific microorganisms and their products in the disease initiation and propagation is still unclear. [\(SOURCE\)](#)

Lately, numerous studies have shown associations between periodontal disease and a number of systemic diseases, such as cardiovascular disease, diabetes mellitus, Alzheimer's disease, and rheumatoid arthritis. This has intensified the research on the role of the microorganisms and their virulence factors in periodontitis. The purpose of this review is to high-light the complexity of the host-microbe relationship in periodontitis as well as the capacity of ordinary low virulent oral commensals to adapt and survive in the periodontal pocket, and to become infectious and contribute to systemic effects on the host.

The salivary microbiome would essentially be comprised of a mixture of microbes sloughed off from all sites. Although there is considerable overlap of species detected in all oral sites, such as certain species of *Streptococcus*, *Gemella*, *Granulicatella*, *Neisseria*, and *Prevotella*, there is often site specificity. For example, species of *Rothia* typically colonize the tongue or tooth surfaces, *Simonsiella* colonizes only the hard palate, *Streptococcus salivarius* mainly colonizes the tongue, and treponemes are typically restricted to the subgingival crevice. It is well known that specific bacterial taxa that colonize the oral cavity are associated with oral health and oral diseases or afflictions, such as dental caries, periodontal diseases, endodontic lesions, dry socket, halitosis, and odontogenic infections. [\(SOURCE\)](#)

Oral bacteria spreading through the body have been associated with a number of systemic diseases. The gut is no exception. Studies in animals and man have indicated that oral bacteria can translocate to the gut and change its microbiota and possibly immune defense. The ectopic displacement of oral bacteria particularly occurs in severe systemic diseases, but also in patients with "chronic" periodontitis. Thus, *Porphyromonas gingivalis*, which creates dysbiosis in the subgingival microbiota and immune defense, may also cause dysregulation in the gut. A dysbiotic gut microbiota may cause diseases elsewhere in the body. The fact that "chronic" periodontitis may affect the gut microbiota could imply that consideration might in the future be

given to a coordinated approach to the treatment of periodontitis and gastrointestinal disease. This area of investigation, which is in its infancy, may represent another pathway for oral bacteria to cause systemic diseases and deserves more research. [\(SOURCE\)](#)