

Understanding and practice of oral microbiome

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1. Microbes may be invisible, but they could be the true masters of both our planet and our bodies. In fact, our bodies contain more microbiome bacteria (roughly 38 trillion) than human cells (about 30 trillion). Microbes are also the primary culprits behind countless infectious diseases including gum disease, COVID-19, the common cold, and pneumonia. The probiotics we take for oral and gut health are actually beneficial microorganisms from fermented foods that have coexisted with humans throughout history. The health benefits of probiotics, as opposed to antibiotics, challenge the 20th century mindset that viewed bacteria only as enemies to be eliminated.
2. The Human Microbiome(Microbe + ome) Project, which applied methods from the 2003 Human Genome(Gene + ome) Project, has revealed diverse microbiomes living throughout our bodies, especially in our intestines and mouths. More recent studies show that these microbiomes are both directly and indirectly linked to many human diseases and health conditions.
3. Oral microorganisms play a particularly significant role. Just as *Helicobacter* is a known risk factor for stomach cancer, the harmful oral bacterium *Fusobacterium nucleatum* is now being identified as a cause of colorectal cancer. Similarly, just as Human Papillomavirus increases cervical cancer risk, *Porphyromonas gingivalis* has long been recognized as a major contributor to dementia and pancreatic cancer. Beyond these serious diseases, growing evidence suggests oral microorganisms worsen metabolic syndrome, while proper oral hygiene is crucial for managing these conditions.
4. The mouth is our body's gateway—not just for food and air, but also for microorganisms. Oral health offers a valuable window into our overall health, and oral hygiene is one of the most cost-effective health practices available. In today's world, where lifestyle-related metabolic conditions are typically treated with medications, and where polypharmacy(multiple prescriptions), side effects, and antibiotic resistance pose major threats to public health and contribute to frailty, side-effect-free oral hygiene practices and (oral) probiotics can serve as crucial safeguards for human health.
5. Oral probiotics are essentially those lactic acid bacteria (commonly sold for gut health) that have been proven to inhibit harmful oral bacteria. However, common probiotic strains like *Lactobacillus* and *Bifidobacterium* can all have some antimicrobial effects against harmful oral bacteria, though to varying degrees. Since all probiotic strains can potentially benefit both the mouth and gut, it's recommended to take not only specific oral probiotics but also general probiotics by holding them in your mouth for a while before swallowing on an empty stomach in the morning.
6. Over the past decade, alongside microbial research, I've been incorporating [oral pathogen testing, probiotic prescriptions - periodontal disease and implant management with metabolic syndrome management] into my clinical practice. Though my experience is still limited, I'd like to share the cases I've worked with and reflected upon. My hope is that 21st-century dentistry, through the lens of microbiome science, will establish itself as a cornerstone of evidence-based lifestyle medicine grounded in scientific and quantifiable data.

Profile

- * Seoul National University, School of Dentistry, Graduate
- * Columbia University, College of Dental Medicine, Graduate
- * Seoul National University, Graduate School of Environmental Studies, Graduate
- * Seoul National University, School of Dentistry, Ph.D.
- * Vice President, Korean Academy of Dental Administration
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- * Present, Chairman of the Board, Apple Tree Medical Foundation