Dear reader,

When you are reading this words, I will have already departed to cover the 7th congress of the European Federation of Periodontology in Vienna. Thousands of professionals involved in periodontology and dental implantology are expected to gather in the Austrian capital in June to discuss latest research results and concepts to fight periodontal diseases.

Although occasionally overlooked, the prevalence of those diseases remains one of the biggest challenges that all professionals in every field of dentistry have to face nowadays in daily practice. From orthodoxistic treatment to long-term maintenance of dental implants, almost every clinical success depends on a healthy periodontium.

Owing to deteriorating trends in health like the obesity epidemic with its side effects in large parts of the US and Europe, this challenge is expected to rise considerably in the years to come, since periodontal inflammation and gum disease have been proven to be closely related to the general state of health.

Unfortunately, in many countries, periodontology still plays a minor role when it comes to dental education as well as the number of chairs and positions established at universities and dental schools.

In addition, interdisciplinary cooperation between periodontists and other fields of dentistry is still lacking, despite the fact that dental professional organisations recommended to check the periodontal status before starting any treatment.

The participation of many dental implant specialists at this Europerio is a ray of hope that the dental community is beginning to understand that their future is not only depending on teeth but also on the tissue that surrounds them.

Yours sincerely,
Daniel Zimmermann
Group Editor
Dental Tribune International

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Vaccination against periodontitis

Prevention of disease, in this case chronic periodontitis, is always better than cure. Developing a vaccine for periodontitis has been a hot subject for periodontal researchers. The old dogma was that the role of vaccination is to induce a humoral immune response, meaning protection by the production of memory B cells and antibodies against the pathogen. This dogma however is too simple. Recent evidence suggests that immunization can modulate the host response and shift the response, a key element for successful protection. The nature of the cellular response and which molecules are secreted by the site by these cells are critical to disease processes, as well as protection.

What is the process of developing a vaccine? First, we have to identify the key pathogens, and then identify and isolate virulence factors from the pathogens as candidate antigens. The candidate vaccine should be tested first in preclinical models followed by safety and efficacy tests in humans.

Eighteen years ago, a research group headed by Roy Page from Seattle was the leader in periodontal vaccination research. They vaccinated primates with whole-cell *P. gingivalis*, and demonstrated partial protection against experimental periodontitis. Interestingly, they found that the levels of specific antibodies against *P. gingivalis* were high in all animals that were exposed to the bacteria, immunized and non-immunized, and antibody production was not able to explain the protection achieved.

From then on, significant efforts were made in identifying molecules that are virulence factors against the pathogen. This dogma however is too simple. Recent evidence suggests that immunization can modulate the host response and shift the response, a key element in successful protection. The nature of the cellular response and which molecules are secreted by the site by these cells are critical to disease processes, as well as protection.

"...we still lack data from clinical trials in animals..."

The open-ended approach that has been most widely used for oral microbial communities and oral infections is the clone-library approach. Indeed, by using this technique, several uncultivated bacteria were found to be associated with periodontitis, but after the first NGS study in which several orders of magnitude (i.e. millions) bacterial 16S DNA codes were analysed, it became clear that so far we had only explored the tip of the iceberg.

Modern molecular analyses offer new approaches to making vaccines by cloning genes from bacteria, expressing the protein antigens in other bacteria in culture and isolating the pure proteins in the laboratory. This makes the preparation safer and easier to prepare. Professor Mike Curtis from the Queens Mary University of London has cloned a gene containing the code for the adhesive part of an important cytotoxin produced by *P. gingivalis*, rgpA. The vector in bacteria was expressed by our own Dr. Asaf Wilensky, who produced a recombinant peptide and used it in vaccination experiments with mice, in which periodontitis was induced by inoculation of *P. gingivalis*, and bone loss was assessed using micro-CT.

A recent hypothesis is that targeting *P. gingivalis* may have a community-wide impact on the flora, and may be important for preventing chronic periodontitis.

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