



PhD in Biomedical Sciences

Research Area: Dentistry

Title: *In vivo* characterization of the microbiome formed on treated and fully machined titanium implant surfaces

Dental implants are considered the best option for the rehabilitation of missing teeth.

Titanium properties make it ideal for osteointegration, which is decisive in the clinical success and longevity of the dental implants.

The long-term survival of dental implants depends, in part, on the control of bacterial infection in the peri-implant region.

Very little is known about the longitudinal development of the peri-implant sub-gingival microbiome and the impact of microorganisms on the structure of the implants. The bacteria surrounding the exposed dental implants form a diverse microbiome, regardless of the patients periodontal profile.

The microbiome present in dental implant failures is often associated with the periodontitis microbiome. Implants with uneven surfaces are now widely used. However, rough surfaces ($Ra > 0.2 \mu\text{m}$) provide a better "substrate" for retention and accumulation of plaque in terms of area, thickness and colony-forming unit that can eventually lead to peri-mucositis and / or peri-implantitis. On the other hand, some studies suggest that smooth surfaces may be less affected by peri-implant disease than rough surfaces.

In this study it is proposed to characterize, for the first time, the microbiome that is formed *in vivo* in implants with different roughness using intraoral devices that simulate implants in the best possible way. It is also intended to investigate the impact of microorganisms on the structure of the implants.

Keywords: implants, peri-implantitis, microbiome, corrosion

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