

## PhD in Biomedical Sciences

Research Area: Implantology / Periodontology

**Title:** Association between IL-1 and IL-1Ra Gene Polymorphisms with Peri-Implantitis

Peri-implantitis is characterized by the presence of inflammatory changes in the soft peri-implant tissues and the level of the crestal bone due to microbial accumulation and/ or iatrogenic factors. Even when exposed to similar risk factors, not all patients develop peri-implantitis, a situation that highlights the importance of genetic predisposition and differences between populations.

The host immune system reacts to bacterial invasion by producing inflammatory mediators such as interleukin-1 (IL-1), tumour necrosis factor alpha (TNF- $\alpha$ ) and prostaglandin E2 (PGE2). Studies have shown that individuals with alterations in the genes coding for IL-1 $\alpha$ , IL-1 $\beta$  or IL-1ra (IL-1 receptor antagonist) are more susceptible to inflammatory diseases such as peri-implantitis.

In the current scientific literature, it is unclear whether host genetic susceptibility may or may not determine susceptibility to biological complications in dental implants, although it has already been cited as a potential risk indicator. In addition, the number of studies in the literature evaluating this possible association is limited and do not refer to certain confounding variables, as the existence or not of periodontitis. No study has ever been conducted in the Portuguese population regarding the presence of this type of polymorphisms. A clarification of the genetic basis and the identification of molecular biomarkers associated with peri-implant pathology could be used to predict peri-implantitis occurrence and to improve treatment and monitoring of dental implant patients.

The primary objective of this study is to evaluate IL-1 gene group polymorphisms in patients with peri-implantitis and to compare them with patients with peri-implant health. It is also intended to investigate the levels of inflammatory response markers IL-1 $\beta$ , PGE2 and TNF- $\alpha$  in peri-implant crevicular fluid of patients with peri-implant health implants and in patients with peri-implantitis and to relate them with the IL-1 genotype.

**Keywords:** dental implants, peri-implantitis, gene polymorphism, peri-implant crevicular fluid

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**Start Year:** 2019