Role of Interleukin-4 over *in vitro* osteoclastogenesis

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INTRODUCTION. The bone resorption factors unbalance is a global problem and occurs as a consequence of different pathologies. Among them, periodontal disease and rheumatoid arthritis stand out due to their high prevalence in world population. In order to better understanding the modulation in bone resorption, the interleukin-4 immunomodulatory role in a recombinant (r) receptor activator of nuclear factor kappa B ligand (RANKL)-mediated-osteoclastogenesis was evaluated.

MATERIAL AND METHODS. Raw 264.7 cells culture was cultured with rRANKL and/or rIL-4, per 7 days. Cell viability (by MTT assay) and number of osteoclast (after TRAP staining) in culture were analysed after 7 days. Nitric oxide (NO) and cytokines production were analyzed after 3 days culture in supernatant.

RESULTS AND DISCUSSION. Cell viability was maintained in all culture groups, presenting a greater number of living cells in relation to negative control group. The concentration of 1 ng.ml⁻¹ of rIL-4 was sufficient to decrease osteoclastogenesis mediated by 100 ng.ml⁻¹ of rRANKL (p<0.001, by ANOVA test), demonstrating the regulatory role of this interleukin in osteoclastogenesis. Regarding to immune response mediators, the rIL-4 addition to rRANKL-stimulated cells promoted the up-regulation of NO production (p<0.001, by ANOVA test, comparing to control), up-regulation of IL-12 production (p<0.05, by ANOVA test, comparing to RANKL-stimulated group), down-regulation of TNF-α (p<0.001, by ANOVA test, comparing to control), and did not affect the IL-1α, IL-1β and IL-10 production. CONCLUSION. It was observed that rIL-4 in association with rRANKL was able to decrease the osteoclastogenesis *in vitro* process. Probably, the IL-4 mechanism occurs due to the TNF-α down-regulation and the maintenance of others immune mediators. By this way, IL-4 may be considered as a target molecular in pharmacological design to bone resorption related disease.

KEY-WORDS: interleukin-4, bone resorption, osteoclastogenesis.

SUPPORT: UCB, CNPq, CAPES and FAPDF