Abstract

Project Code : MRG5580139

(รหัสโครงการ)

Project Title : โครงการความแตกต่างในความสามารถของของเซลล์สร้างกระดูกที่ได้(ชื่อโครงการ) จากกระดูกขากรรไกรและกระดูกสะโพกในการเกื้อหนุนการเกิดเซลล์ ทำลายกระดูก

Investigator : นางสาววรรณกร ศรีอาจ

(ชื่อนักวิจัย) คณะทันตแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

E-mail Address : w.sriarj@gmail.com

Project Period : 2 ปี

(ระยะเวลาโครงการ)

Abstract

Cytokines play important roles in bone remodeling by modulating the balance between bone formation and resorption. In mouse model, Interleukin-4(IL- 4) has been shown to inhibit osteoclast formation. However, the effect of IL-4 on human osteoblast is still unknown. Our study showed osteoblast-liked cells expressed both IL-4 receptor and STAT6, the main intermediate signaling molecules in the IL-4 pathway. The results prompt us to investigate the influence of IL-4 on osteoclastogenesis by determining the expression of RANKL/OPG in human osteoblast-like cells. Mandible-derived osteoblast-liked cells were established. The expression of RANKL/OPG mRNA was investigated using real-time RT-PCR. The results indicated IL-4 suppressed the expression of RANKL/OPG dose-dependently. The mechanism of IL-4- modulated RANKL/OPG expression was studied by means of inhibitors including STAT6 inhibitor (AS1517499), NF-kB inhibitor and PI3K inhibitor. The addition of STAT6 inhibitor as well as NF-kB inhibitor, but not PI3K inhibitor could abolish the effect of IL-4. Interestingly, addition of $CoCl_2$, an activator of HIF-1α, abolished the inductive effect of IL-4 on OPG expression indicating the influence of oxygen level. These findings suggested the role of IL-4 on osteoclastogenesis by suppressing RANKL/OPG ratio via STAT6 and NF-kB pathways and might be influenced by the oxygen level in the tissue.

Keywords : Interleukin-4, Osteoblasts, Osteoclastogenesis, RANKL/OPG expression