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CCR4 Play a key role in a mouse fracture healing model

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Objective: Fractures can trigger an immune response that disturbs the homeostasis of osteoblast and osteoclast through the production and release of cytokines and their receptors. The purpose of the study was to investigate CCR4 as potential cellular components of the osteoimmune system's response to an in vivo model of bone injury. The absence of CCR4 influences the fate of other responder cells in proliferation, differentiation, matrix production, and ultimate callus formation.

Methods: Tibia fractures were induced in 50 CCR4-deficient mice and 50 control C57BL/6 mice. Examinations of radiographs, basic histology, mechanical testing, flow cytometry, immunohistochemical, as well as enzyme-linked immunosorbent assay for the effector cytokines interleukin-2 (IL-2), interferon, and IL-6 were performed.

Results: Animals deficient in CCR4 cells revealed less mature histologic elements and quantitative decreases in the expression of major bone (bone sialoprotein) and cartilage (type II collagen) matrix proteins and in the expression of bone morphogenetic protein 2 at a critical reparative phase. Moreover, only CCR4-deficient animals had an increase in the osteoprogenitor antiproliferative cytokines IL-6 and interferon at the reparative phase. The result improved stability at the repair site and an overall superior biomechanical strength in CCR4-deficient mice compared with controls.

Conclusion: The evidence for a role of CCR4 in the context of skeletal injury indicated the importance of the immune system's influence on bone biology, which is associated with the field of osteoimmunology, and offers a potential molecular platform from which to develop essential therapeutic strategies.

Biography

Baochi Liu received his PhD from Zhengzhou University in 2007. He received his BS in 1983. He has many peer-reviewed publications in reputed journals. His research interest includes general surgery, surgery infection and trauma. He is currently working as a Director and Professor in Department of Surgery, Shanghai Publical Health Clinical Center Affiliated to Fudan University, Shanghai, China.

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