利用類幹細胞及血小板濃厚液於骨質疏鬆症之組織再生研究

Tissue-regeneration of osteoporosis using embryo-derived NIH3T3 cells regulated by TGF-β1 in platelet-rich plasma

中文摘要

本研究目的在探討如何利用細胞治療來預防骨質疏鬆症。SAM（senescence accelerated mice)老鼠在早期的研究已被證實爲與骨骼老化及骨骼生理有關，本研究將利用 SAMP8 老鼠以去除性腺產生嚴重骨質疏鬆症作爲實驗動物的模式。細胞材料利用具有類似間葉幹細胞特性之老鼠胚胎纖維母細胞 NIH3T3 先處理 Platelet-Rich Plasma（PRP）促進其細胞增生與骨母細胞分化(osteoblastogenic differentiation)之能力，並移植到 SAMP8 體內觀察細胞治療的長期效果。探討治療後的 SAMP8 老鼠骨質密度的改變，是否有減少降低骨質流失的現象，再以組織切片染色。目前的實驗我們發現 NIH3T3+PRP 後的 SAMP8 老鼠在四個月後骨質有明顯的增加，且在免疫染色的結果發現我們的 NIH3T3 有移動到全身各地，並結合了光學影像（optical imaging）照影系統的模式追蹤細胞所在位置。在本實驗證實了移植到 SAMP8 老鼠 NIH3T3＋PRP 有治療骨質疏鬆症的現象。

英文摘要

Osteoporosis has became a major public health problem in all developed countries. Despite numerous investigations, treatment and prevention of osteoporosis remains unsolved issues. Many researches focus on age-related bone in experimental animals models in senescence accelerated mice (SAM). In this study we establish the ovariectomized mice by SAMP8 mice as osteoporosis animal model. NIH3T3 was capable to differentiate into osteoblast followed by stimulation with platelet-rich plasma and injected into the knee joint. PRP also has been reportrd to promote osteogentic differentiation of stem cell. We have recently established a system to transplant stem cells into SAMP mice to prevent osteoporosis. Treated SAMP mice showed a marked increase in bone mineral density (BMD) and decrease bone loss. We also trace the stem cell migration into the whole body that could induce osteogenesis to prevention of osteoporosis. In this experiment we found that transplantation with NIH3T3 and PRP could obviously increase BMD in the 3 month time point and traced the stem cell migration into the whole body detected by using immunhistochemical staining and optical imaging. Therefore, this study examined the NIH3T3 ＋ PRP transplant into the SAMP8 mice to prevent the osteoporosis