

Modification of Insulin-Like Growth Factor-1 Gene Induces Differentiation of Adipose-derived Stem Cells into Chondrocytes

Xiaowei Jiang^{1,2}, Shiming Feng³, Lu Yu⁴, Kun Shi³, Wei Chen¹ and Guilong Jing^{2,*}

¹*Department of Rehabilitation, Xuzhou Central Hospital, Xuzhou 220019, Jiangsu Province, China*

²*Department of Rehabilitation, Xuzhou Rehabilitation Hospital Affiliated to Xuzhou Medical University/Xuzhou Rehabilitation Hospital, Xuzhou 221018, Jiangsu Province, China*

³*Department of Orthopedics, Xuzhou Central Hospital, Xuzhou 221019, Jiangsu Province, China*

⁴*School of Basic Medicine, National Demonstration Center for Experimental Basic Medical Science Education, Xuzhou Medical University, Xuzhou 221004, Jiangsu Province, China*

KEYWORDS Adipose-derived Stem Cell. Chondrocyte. Differentiation. Insulin-like Growth Factor-1

ABSTRACT The researchers aimed to assess the effects of modification by insulin-like growth factor-1 (IGF-1) gene on the differentiation of adipose-derived stem cells (ADSCs) into chondrocytes. Rat ADSCs were divided into normal, control and experiment groups. Experiment and control groups were transfected with pcDNA3.1-IGF-1 and pcDNA3.1-IGF-1-NC, respectively. Their osteogenic, adipogenic and chondrogenic differentiation capacities were determined using alizarin red staining, oil red O staining and toluidine blue staining, respectively. The expressions of type I collagen (ColI) and ColII were detected by immunofluorescence assay, and the protein expressions of ColI, ColII and IGF-1 were measured by Western blotting. Compared with the normal group, the experiment group had significantly enhanced osteogenic, adipogenic and chondrogenic differentiation capacities and increased protein expressions of ColI, ColII and IGF-1 ($P < 0.05$), whereas normal and control groups had similar results ($P > 0.05$). Modification by IGF-1 gene obviously contributes to the differentiation of rats ADSCs into chondrocytes.