PRINT: ISSN 0972-3757 ONLINE: ISSN 2456-6330
International Journal of
HUMAN GENETICS

Full text open access online (Since 2001)

PRINT: ISSN 0972-3757 ONLINE: ISSN 2456-6330
Int J Hum Genet, 24(1): 89-96 (2024)
DOI: 10.31901/24566322.2024/24.01.839

miR-137 Targets Runt-related Transcription Factor 2 to Regulate Osteogenic Differentiation of MC3T3-E1 Cells

Huaiguang Chang[1, 2], Qijian Jiang[1], Yingnan Du[1], Yidan Feng[1], Bingjie Li[1] and Lei Zhang[1,*]

[1]Department of Stomatology, Ningbo College of Health Sciences, Ningbo 315100, Zhejiang Province, China
[2]Department of Prosthodontics, Yinzhou Stomatology Hospital, Ningbo 315100, Zhejiang Province, China

KEYWORDS Expression. MC3T3-E1 Cell. Micro Ribonucleic Acid-137. Osteogenic Differentiation. Runt-related Transcription Factor 2

ABSTRACT The present study sought to clarify the regulatory roles of miR-137 and runt-related transcription factor 2 (RUNX2) in the osteogenic differentiation of MC3T3-E1 cells. Specifically, MC3T3-E1 cells fell into control, negative control (NC) mimic and miR-137 mimic groups. According to the online database TargetScanHuman, a binding site was detectable between miR-137 and RUNX2 in the 3' untranslated region. It was unveiled that miR-137 caused a plummet in the expression of wild-type RUNX2 ($P<0.05$), but had no obvious effect on mutant RUNX2. Relative to control and NC mimic groups, miR-137 mimic group had significantly lower activity of alkaline phosphatase, concentration of alizarin red S, and mRNA and protein expression levels of RUNX2, osteopontin and osteocalcin, but higher expression levels of lipoprotein lipase, adipocyte binding protein-2 and leptin ($P<0.05$). To sum up, miR-137 affects the osteogenic differentiation of MC3T3-E1 cells *via* negatively regulating the RUNX2 expression.