

Phospholipase C- β 1 in Adipose Derived Stem Cell osteogenic differentiation

Giulia Ramazzotti¹, Francesca Chiarini², Roberta Fiume¹, Isabella Rusciano¹ and Irene Faenza¹

¹Università di Bologna, Dipartimento di Scienze Biomediche e Neuromotorie, Bologna, Italia

²CNR, Istituto di Genetica Molecolare, Bologna, Italia

Human Adipose Derived Stem Cells (ADSCs) are mesenchymal stem cells isolated from adult lipoaspirates collected during liposuction procedures. These cells have been reported to differentiate down many different lineages including chondrogenic, osteogenic, adipogenic and neural[1]. We have previously investigated the role of Phospholipase C- β 1 (PLC- β 1) signaling both in C2C12 murine myoblast differentiation and osteogenic transdifferentiation, showing a remarkable increase in PLC- β 1 mRNA and protein expression in both the processes[2,3]. Here we present data on the role of PLC- β 1 in osteogenic differentiation of ADSCs. Notably, PLC- β 1 expression varies during ADSC osteogenic differentiation: at first, its expression is reduced then it shows a marked increase. Nonetheless, PLC- β 1 overexpression and silencing experiments demonstrated that its expression is essential for the differentiation process to take place. Since PLC- β 1 expression fluctuates during osteogenic differentiation, we investigated if these variations were similar to cyclins expression pattern. Unexpectedly, we found that not only PLC- β 1 expression varies with cyclin E expression but also that the two proteins interact during osteogenic differentiation. This study provides molecular evidence for future therapeutic strategies for bone regeneration by targeting PLC- β 1 signaling pathway.

References

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Key words

PLC- β 1, Stem cell differentiation, osteogenesis.