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POSTER

Direct reprogramming of fibroblasts into endothelial progenitor cells by defined factors

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Abstract

Background: Endothelial progenitor cells (EPCs) are important progenitor cells in vasculogenesis as well as in tissue engineering. However, few EPCs can be isolated from bone marrow, peripheral blood and umbilical cord blood. Moreover, their in vitro proliferation potential is also limited. Therefore, this study aimed to produce EPCs from direct reprogramming of fibroblasts by transduction with certain specific factors.

Methods: Human fibroblasts were collected from human skin by published protocols. The cells were transduced with 2 viral vectors containing 5 factors, including Oct3/4, Sox2, Klf4, c-Myc (plasmid 1), and VEGFR2 (plasmid 2). Transduced cells were treated with endothelial cell medium for 21 days. The cells were analyzed for expression of Oct3/4, Sox3, Klf4, c-Myc and VEGFR2 at day 5, and for EPC phenotype at day 21.

Results: The results showed that after 5 days of transduction, fibroblasts acquired partial pluripotency. After 21 days of transduction and culture in endothelial cell medium, the cells exhibited endothelial markers (e.g. CD31 and VEGFR2) and formed blood vessel-like capillaries.

Conclusion: Our findings suggest another strategy for direct reprogramming of fibroblasts into EPCs.

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References