

Conditioned medium of endothelial cells promotes the endothelial and hematopoietic differentiation of embryonic stem cells

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Endothelial cells regulate HSC function and contribute to the creation of HSC niches *in vivo*. Endothelial cells are capable of maintaining and expanding HSCs in culture. The purpose of this study was to clarify the roles of the mouse bone marrow endothelial cell conditioned medium (mEC-CM) in hematopoietic and endothelial differentiation of mESCs. The results showed that the effect of EC-CM was as potent as cytokine cocktail (combination of VEGF, bFGF, IGF and EGF) on endothelial and hematopoietic differentiation of mESC, the percentage of Flk positive cells and hematopoietic clony-forming cells (CFU-GM, BFU-E, CFU-GEMM) did not show the significant differences between them; ESC derived cells induced by mEC-CM and cytokine cocktails both expressed hematopoietic and endothelial specific genes such as PECAM1, Flk1, Runx1, Tie2 and β -H1. However, ECCM combined with cytokines cocktails did not show a noticeable synergistic effect. Furthermore, we manually selected and identified DiI-Ac-LDL uptake positive cells derived from ESCs after differentiation culture with EC-CM, these DiI positive cobble stone like cells could form capillary-like tube structure on marigel, and showed the positive staining on CD31 and vWF. Thus EC-CM may contain various cytokines which could promote the differentiation of ESCs into hematopoietic and endothelial cells *in vitro*.

Keywords: mEC-CM, mESCs, endothelial cells, hematopoietic cells, DiI-Ac-LDL

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