S27_5

The Role of TGF-β and the Transcription Factor KLF-10 in the Function of Early Endothelial Progenitor Cells

Oshrat Raz[1,2], Dorit Leshem-Lev[2], Alexander Battler[1,2,3], Eli Lev[1,2,3]
[1]*Sackler Faculty of Medicine, Tel Aviv University, Israel*
[2]*The Felsenstein Medical Research Center, Rabin Medical Center, Israel*
[3]*Cardiology Department, Rabin Medical Center, Israel*

Introduction:

Previous studies have suggested the importance of endothelial progenitor cells (EPCs) in the process of vascular injury repair and that platelets mediate and enhance their recruitment and functional properties. Yet, the mediators of this interaction are unclear. Transforming growth factor-β(TGF-β)is a growth factor which has a role in regulation of vessel endothelium. TGF-βis located in platelets' alpha granules and released upon activation. Krüppel-like factor-10 (KLF-10), a subclass of the zinc-finger transcription factors family, participates in various aspects of cellular growth and differentiation. In response to TGFβ-1, KLF-10 has an important role in controlling EPC differentiation and function *in-vitro*and*in vivo.*Thus, we aimed to investigate the role of TGF-β and KLF-10 in the improvement of EPC functional properties in response to platelets.

Methods:

Human EPCs were isolated from donated Buffy coats and cultured for 7 days with or without platelets, in the presence or absence of TGF-β receptor II (TGFβRII) inhibitor. EPCs functional properties were evaluated by their capacity to form colonies (tested by using an inverted microscope), to proliferate (examined by the MTT assay) and to differentiate (expression of the mature endothelial markers Tie-2 and VE-cadherin, evaluated by FACS). Culture supernatants were collected and TGF-β concentration was evaluated using an ELISA kit. RNA levels of KLF-10 were evaluated in EPCs using RT-PCR.

Results:

After 7 days of culture, cell viability, the expression of endothelial markers and the capacity to form colonies, were higher in EPCs co-incubated with platelets, and attenuated by the TGFβRII inhibitor. Nonetheless, EPCs treated with platelets had a higher concentration of TGFβ1in their supernatant and a higher expression of KLF-10 transcripts.

Conclusion:

TGF-β and its downstream transcription factor, KLF-10, may be key regulators in EPC – platelet interaction and in enhancement of various aspects of EPC function.