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Expression of the HDL receptor Ecto-F1-ATPase in human endothelial progenitor cells

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Background. The human endothelial progenitor cells (hEPC) are stem cells derived from bone marrow, which mobilize to peripheral blood and differentiate into mature endothelial cells (EC), participating in vascular repair. These mechanisms are promoted by high density lipoproteins (HDL); however, little is known about the receptors involved. A new receptor of HDL was recently described in mature EC, the cell surface ATP synthase or ecto-F1-ATPase, whose activation promotes angiogenic events. This study aims to determine the expression of ecto-F1-ATPase in the cell surface of hEPC.

Methods: The hEPC were obtained from peripheral blood of young healthy subjects, separated through density gradient centrifugation and cultured for 3 and 7 days on fibronectin-coated plates. The expression of ecto-F1-ATPase was detected by confocal microscopy and flow citometry.

Results: By confocal microscopy, the ecto-F1-ATPase was detected in non-permeabilized hEPC, where it co-localizes with specific surface markers, like KDR (VEGFR2) and CD34. As a control, ATP synthase co-localized with COX-4 in the mitochondria of permeabilized hEPC. By flow citometry, 8 to 15% of hEPC expressed ecto-F1-ATPase at the cell surface.

Conclusion: These results demonstrate that in addition to the constitutive mitochondrial expression of the ATP synthase, the hEPC expresses this enzyme in the cell surface (ecto-F1-ATPase), representing the first evidence of the expression of this HDL receptor on hEPC. However, the role of this receptor in the protective effects of the HDL remains to be determined

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