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Circulating endothelial cells (CECs) in peripheral blood

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CECs as well as bone-marrow-derived endothelial precursor cells (EPCs) are very rare events in the peripheral blood that have a high potential diagnostic value in different diseases which are characterized by cardiovascular problems and/or angiogenesis, e.g. cancer, ischemia and diabetes. Flow cytometry analysis of CECs is difficult because CECs are often discriminated using a combination of antigens with low, dull, or a continuum of cell surface expression. Since CECs can't be characterized by a single marker, a combination of at least two markers is necessary. Therefore different combination of several endothelial markers (CD31, CD34, CD146, KDR and CD144) was used in order to get a more accurate discrimination of CECs. Such a test evidenced that KDR and CD144 were very weakly expressed on the CEC cell surface and could not be reliably analysed, while CD31, CD34 and CD146 were largely detected and therefore chosen for the panel. Dead cells, microparticles [1] and platelets were excluded from the analysis by using a DNA stain (Syto16) and a live/dead marker (NiRed). Leucocytes were excluded by gating CD45- cells. CD106 is expressed on endothelial cells after stimulation with cytokines and allows analysis of activated subsets of CECs.

References

[1] Lanuti et al. (2012) A novel flow cytometric approach to distinguish circulating endothelial cells from endothelial microparticles: Relevance for the evaluation of endothelial dysfunction. J Immunol Methods. 29; 380: 16-22.

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