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Human endothelial progenitor cells express a functional TRPV4 channel

Germano Guerra[1], Silvia Dragoni[2], Valentina Poletto[3], Alessandra Florio Pla[4], Mariapia Cinelli[5], Domenico Tafuri[6], Umberto Laforenza[2], Luca Munaron[4], Vittorio Rosti[1], Stefania Montagnani[5], Francesco Moccia[2]

[1] Department of Medicine and Health Sciences, University of Molise, 86100 Campobasso, Italy
[2] Department of Biology and Biotechnology "L. Spallanzani", University of Pavia, 27100 Pavia, Italy
[3] Laboratory of Biotechnology, Fondazione IRCCS Policlinico San Matteo, 27100 Pavia, Italy
[4] Department of Life Sciences and Systems Biology, University of Turin, 10123 Torino, Itay
[5] Department of Public Health, University of Naples "Federico II", 80131 Napoli, Italy
[6] Department of Sport Sciences and Wellness, University of Naples "Parthenope", 80133 Napoli, Italy

Endothelial progenitor cells (EPCs) are mobilized into circulation to replace damaged endothelial and recapitulate the vascular network of injured tissues (Moccia F et al., 2014). Intracellular Ca(2+) signals are key to EPC activation, but it is yet to be elucidated whether they are endowed with the same blend of Ca(2+) –permeable channels expressed by mature endothelial cells. For instance, endothelial colony forming cells (ECFCs), the only EPC subset truly committed to acquire a mature endothelial phenotype, lack canonical transient receptor potential channels 3, 5 and 6 (TRPC3, 5 and 6), which are widely distributed in vascular endothelium; on the other hand, they express a functional store-operated Ca(2+) entry (SOCE). The present study was undertaken to assess whether human circulating EPCs possess TRP vanilloid channel 4 (TRPV4), which plays a master signalling role in mature endothelium, by controlling both vascular remodelling and arterial pressure. W e found that EPCs express both TRPV4 mRNA and protein indicating that human circulating EPCs possess a functional TRPV4 protein before their engraftment into nascent vessels (Dragoni et al., 2014).

References

[1] Moccia F et al. (2014) Ca2+ signalling in endothelial progenitor cells: a novel means to improve cell-based therapy and impair tumour vascularisation. Curr Vasc Pharmacol. 12(1):87-105.
[2] Dragoni S et al. (2014) A functional transient receptor potential vanilloid 4 (TRPV4) channel is epxressed in human endothelial progenitor cells. J Cell Physiol. Jun 9. doi: 10.1002/jcp.24686. [epub ahead of print].

Keywords

Endothelial progenitor cells, transient receptor potential channels, SOCE, vascular remodeling, Ca (2+) signalling.