IJAE
Vol. 119, n. 1 (Supplement): 154, 2014
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

Ultrastructural and functional differences between normal and tumor endothelial progenitor cells

Valentina Poletto[1], Marco Biggiogera[2], Elisa Bonetti[1], Matteo Della Porta[3], Camillo Porta[4], Mariapia Cinelli[5], Stefania Montagnani[5], Domenico Tafuri[6], Francesco Moccia[2], Vittorio Rosti[1], Germano Guerra[7]

[1] Laboratory of Biotechnology, Fondazione IRCCS Policlinico San Matteo, 27100 Pavia, Italy
[2] Department of Biology and Biotechnology "L. Spallanzani", University of Pavia, 27100 Pavia, Italy
[3] Department of Hematology Oncology, Fondazione Istituto Di Ricovero e Cura a Carattere Scientifico Policlinico San Matteo, Pavia, Italy
[4] Department of Medical Oncology, Fondazione IRCCS Policlinico San Matteo, 27100 Pavia, Italy
[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
[7] Department of Medicine and Health Sciences, University of Molise, 86100 Campobasso, Italy

Endothelial progenitor cells (EPCs) may be released from bone marrow to sustain the angiogenic switch that promotes tumor growth and metastatization of several solid cancers (Moccia et al., 2014). It has long been thought that tumor endothelium represents a rather stable structure, devoid of the genetic heterogeneity featuring neoplastic cells; however, more recent studies showed that tumor endothelial cells (TECs) present with an altered gene expression profile that bestows massive morphological and functional differences on them as compared to normal cells (Aird, 2012). Similarly, circulating EPCs isolated from individuals suffering from metastatic renal cellular carcinoma (mRCC) undergo a significant remodelling of their Ca^{2+} machinery, which is a master regulator of both angiogenesis and vasculogenesis. The present study clearly indicate that EPCs isolated from RCC (RCC-EPCs) and breast carcinoma (BC-EPCs) patients display ultrastructural and functional differences as compared to normal cells (N-EPCs).

References

[1] Moccia et al. (2014) Orai1 and transient receptor potential channels as novel molecular targets to impair tumor neovascularization in renal cell carcinoma and other malignancies. Anticancer Agents Med Chem 14: 296-312.
[2] Aird WC (2012) Endothelial cell heterogeneity. Cold Spring Harb Perspect Med 2: a006429.

Keywords
Endothelial progenitor cells, renal cellular carcinoma, breast carcinoma, electron microscopy, TUNEL assay, apoptosis.