IJAE
Vol. 121, n. 1 (Supplement): 179, 2016
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

Expression and localization of Phosphoinositide-specific Phospholipase C enzymes in polarized macrophages

Tania Di Raimo [1] - Rita Businaro [1] - Martina Leopizzi [1] - Carlo Della Rocca [1] - Vincenza Rita Lo Vasco [2]

[1]Dipartimento di Scienze e Biotecnologie Medico-Chirurgiche, Università di Roma Sapienza, Polo Pontino, Latina, Italia - [2]Dipartimento Organi di Senso, Università di Roma Sapienza, Roma, Italia

The phenotypic and functional diversity of macrophages depends on differentiating programs being developed during the cells' lives. Great interest was addressed to identify the signal transduction pathways acting in macrophage polarization, including the phosphoinositide (PI) system and related phospholipase C (PLC) family of enzymes. Enzymes belonging to the PLC family are strictly tissue specific and the expression panel, as well as the subcellular localization differs in quiescent cells compared to the pathological counterpart. We analyzed the expression of PLC enzymes in unpolarized (M0), M1 and M2 macrophages to list the isoforms expressed in the polarized macrophages and their subcellular localization.

Our results confirmed that macrophages express a wide number of PLC isoforms. All PLC enzymes were detected within both M1 and M2 cells, but not in M0 cells. M0, as well as M1 and M2 cells own a specific panel of expression, different for both genes' mRNA expression and intracellular localization of PLC enzymes. PLC enzymes might play a complex role in macrophages during inflammation and probably also during polarization.

References

[1] Pollard JW. Trophic macrophages in development and disease. Nature Reviews Immunology, vol. 9, no. 4, pp. 259–270, 2009.
[2] Osborn O, Olefsky JM. The cellular and signaling networks linking the immune system and metabolism in disease. Nature Medicine, vol. 18, no. 3, pp. 363–374, 2012.
[3] Daigneault M, Preston JA, Marriott HM, Whyte MK, Dockrell DH. The identification of markers of macrophage differentiation in PMA-stimulated THP-1 cells and monocyte-derived macrophages. PLoS One. 2010 Jan 13;5(1):e8668. doi: 10.1371/journal.pone.0008668.
[4] Mosser DM, Edwards JP. Exploring the full spectrum of macrophage activation. Nat Rev Immunol. 2008;8:958–969.

Keywords
Macrophages; polarization; M1; M2; phosphoinositide; phospholipase C; signal transduction.