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Subcellular localization and phosphorylation of phosphoinositide-phospholipase C γ1 correlate with breast cancer invasiveness

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Activation of the enzyme phosphoinositide-phospholipase C γ1 (PLCγ1) is thought to play a critical role in both cytoskeletal changes and migration associated with the metastatic process. Activation of PLCγ1 by phosphorylation can occur downstream of many tyrosine kinase receptors including epidermal growth factor receptor, vascular endothelial growth factor receptor-2, c-MET, platelet-derived growth factor receptor, and also certain integrins. Activation induces hydrolysis of phosphatidylinositol 4,5-biphosphate to form the second messengers diacylglycerol and inositol-1,4,5-triphosphate, which in turn activate a number of signalling pathways. PLCγ1 is highly expressed in several tumours, including breast carcinomas in which the enzyme has been shown to be required for epidermal growth factor induced migration of breast cancer cells. In order to establish the significance of PLCγ1 subcellular localization and phosphorylation (PLCγ1-pY783 and PLCγ1-pY1253) in breast cancer, we compared, through the use of different methods, two different breast cancer models: the low-tumorigenic BT-474 cell line and MDA-MB-231 cell line which represents a more aggressiveness de-differentiated cell type, obtained from a pleural effusion from a patient.

Keywords: breast cancer; PLC; metastatic proces.