

Specific PI-PLCs expression patterns as prognostic factors in breast cancer

Valeria Bertagnolo¹, Silvia Grassilli¹, Eros Magri², Massimo Pedriali², Maria Palomba¹, Federica Brugnoli¹, Ervin Nika¹, Silvano Capitani¹

¹Signal Transduction Unit-Laboratory of Cell Biology, Section of Human Anatomy, Department of Morphology and Embryology, University of Ferrara, Italy

²Section of Pathological Anatomy, Histology and Cytology, Department of Experimental and Diagnostic Medicine, University of Ferrara, Italy

In industrialized countries, breast cancer is, in incidence and mortality, in first place among malignant tumors of the female population. In Italy, this neoplasia is diagnosed in about 32,000 women annually and causes approximately 11,000 deaths overall. Like many cancers, breast cancer presents alterations in intracellular signal transduction pathways leading to increased proliferative potential, sustained angiogenesis, apoptosis inhibition, invasiveness and metastatic dissemination. The molecular changes that determine the onset of breast cancer are still largely unknown and, due to the high heterogeneity of this neoplasia, no specific protein pattern allows, at present, to fully characterize and proficiently monitor its progression.

Among the molecules involved in intracellular signal transduction pathways, the phosphoinositide dependent phospholipase C (PI-PLC) is involved in tumorigenesis of a variety of tissues, including breast epithelium. Altered expression of phospholipase C-beta 2, -gamma 1 and -delta 4 occur in invasive breast cancers and correlate with tumor-related features, such as cell proliferation and invasiveness, suggesting that these isoforms play an important role in the progression of the disease. Aim of this study was to identify a correlation between the expression levels of different PI-PLC isozymes within single tissue samples and the clinical profile of patients to whom the primary tumor had been removed. This was achieved by performing an immunohistochemical study followed by a retrospective multivariate analysis of invasive breast tumors with different malignant features, in terms of final grade of malignancy, size, proliferation index and receptor pattern, for which a follow-up of at least 5 years was available. Even if preliminary, the obtained results allowed to identify specific expression profiles of the proteins under investigation which showed, independently from the tumor final grade, a significant correlation with the clinical outcome of the patients.

Given the heterogeneity that characterizes breast tumors, the obtained results demonstrate that, regardless the histopathological classification, each invasive breast tumor shows a specific pattern of expression of PI-PLC isozymes, that may help to characterize more precisely the neoplasia and contribute to predict the clinical course of individual patients.

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