On the Road to Targeted Therapy of Resistant Human Breast Cancer

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Multidrug resistance (MDR) is one of the most important problems on medical oncology field. However, the mechanisms involved in MDR are far from being clarified and conquered. Therefore, the identification of key signaling mediators that contribute for the MDR process is urgently called for. In this way, the aim of this study was to provide a differential kinome profile, by using PepChip®, between two human breast cancer cell lines (MCF7 and resistant MCF7). We evaluated the *in vitro* phosphorylation of peptide arrays exhibiting the majority of Phospho.ELM-deposited protein sequences on lysates from both cell lines. From PepChip data, we observed that protein kinase C isoforms (PKCa, PKCßII, PKCd) and casein kinase 2 (CK2) were highly active (~3-fold) on the cell line with resistance phenotype. In addition, these data were validated by a traditional biochemistry technique, western blotting, which confirmed that in resistant cells PKC activity was upregulated. Our findings indicate that PKC and CK2 might be promising targets to tackle breast cancer resistance. Besides, the PepChip technique appears as a powerful tool to predict metabolic differences between cancerous and healthy cells as well as providing preliminary hits for developing smart drugs.

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