

Cancer Stem Cells in Breast Cancer Cell Lines

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Breast cancer is the most widespread cancer detected in women worldwide. In most patients death is caused by the metastatic disease which can evolve from the primary tumor. A cellular phenomenon, namely multi-drug resistance, is one of the main explanations for progression of this disease, occurring through the ATP-binding cassette (ABC) transporter family. Recent studies identified cancer stem cells subpopulations in mammary tumors using cell surface markers. Thereafter, breast cancer has been described according to the cancer stem cells model. One of stem cells hallmarks is their ability to exclude the Hoechst 33342 vital dye, which occurs by efflux attributed to ABC transporters. Due to this characteristic, subpopulations capable of excluding that dye are putative stem cells, possibly responsible for tumor progression. Therefore, the aim of this work is to evaluate the presence of stem cells in breast cancer cell lines subpopulations displaying the ability to pump out the Hoechst 33342 fluorescent dye and correlate with their degree of malignancy and metastatic potential. MCF-7 and MDA-MB-231 breast cell lines (respectively, low and high malignancy potential) were analyzed by flow cytometry using three parameters: size (FSC), complexity (SSC) and Hoechst 33342 vital dye exclusion. Preliminary results show that MDA-MB-231 displays a larger amount (11.9%) of cells which are able to exclude the Hoescht dye than MCF-7 (4.8%). Furthermore, MDA-MB-231 displays more small cells (38.6%) than MCF-7 (13.3%). These results indicate a possible correlation between the greater invasive potential of MDA-MB-231 and the presence of a larger number of stem cells in this tumor line.

Key-words: breast cancer stem cells, ABC transporters, tumor progression.

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