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Breast cancer stem cells: Novel target for breast cancer therapy

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Cancer stem cells (CSCs) are a subpopulation of tumour cells that possess the stem cell properties of self-renewal and differentiation. The cancer stem cell hypothesis addresses not only the issue of tumour initiation, tumour's recurrence and metastasis, but also tumour's resistance to conventional cancer therapy. The formation of cancer stem cells is provoked by epigenetic alterations and mutations of genes responsible for signal transmission. Breast cancer stem cells have been confirmed to have a $CD44^{+}/CD24^{-}$ phenotype. Expression of CD44 plays a critical role in cell differentiation, adhesion, and metastasis of cancer cells. New phenotypes such as ALDH1 positivity have been linked to self-renewal and cell differentiation in breast cancer. ALDH1 is becoming increasingly important marker for isolation of breast CSCs, and is a predictor of poor clinical outcome. As breast CSCs are responsible for resistance to current radiation and chemotherapy, it is crucial to identify specific markers to CSC, to develop new therapeutic strategies aimed at specific targeting of this population yielding more effective treatments. Several strategies for targeting CSCs have been proposed, none of these drugs could specifically target CSCs in the clinic. Antibodies targeting breast CSCs is a potential strategy to improve the outcome of cancer patients. Universal markers such as ALDH1 could mark out CSCs from normal cells enabling specific targeted therapy of breast cancer.

Biography

Dr Zahra Madjd has completed her MD in Tehran, Iran and conducted her PhD and postdoctoral studies from Department of Clinical Oncology, University of Nottingham, UK. She is currently assistant professor of Immunopathology at Departments of Pathology and Molecular Medicine, also research deputy of Oncopathology Research Centre, Tehran University of Medical Sciences. She has published more than 28 papers in prestigious journals and serving as co-editor of "Iranian J Cancer Prevention".