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Human breast cancer stem cells: Isolation and molecular characterization to understand mechanism of breast cancer

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Breast cancer remains a leading cause of morbidity and mortality in Indian women. Last 6 years, our lab is working on studying molecular markers for early detection of breast cancer and established BRCA1 & BRCA2 testing. We have reported novel founder mutation in BRCA2 gene in Indian women. As identification of potential breast cancer stem cells is most important in a view of targeting these cells, we thought of isolating & molecular characterizing these cell types from metastatic breast cancer tumor. Our Immunofluorescence studies have shown that these cells are large cells with enlarged nucleus and nucleolus with granulated cytoplasm. These cells highly expressed nine breast cancer specific genes indicating their cancer phenotypes. It was also observed that these Breast Cancer Initiated cells transferred their cancer phenotype to neighboring normal cells to make them transform. Therefore targeting of these cells by specific biomarkers is a major task in curing breast cancer at advance stage of cancer. We have also looked at additional pluripotency markers in these cell types and interestingly, it was found that SOX2 & OCT4 genes were completely down regulated in these cancer stem cells. We have therefore proposed further hypothesis to introduce these genes in these cancer stem cells to developed iPSC cell line. These iPSC cells may be useful for restricting and killing of breast cancer tumor cells from their respective patient as a breast cancer therapy in near future. This presentation will highlight innovative approach for future diagnosis & therapies of breast cancer.

Biography

Pravin D Potdar has completed his PhD from Cancer Research Institute, Tata Memorial Centre Mumbai in year 1991. He has worked as a Senior Scientist for 20 years at Cancer Research Institute (Present ACTRECT), and did extensive research on establishing Biomarkers for early detection of lung, breast and oral cancers. He has more than 30 years of research experience in the field of cellular and molecular biology of cancer and other genetic disorders. He was a Fellow of National Institute of Health (NIH), USA and also worked as a faculty at M.D. Anderson Cancer Centre, Houston, Texas, USA for 3 years. He is a recipient of prestigious National Cancer Institute, NIH, USA and a Birla Smarak Kosh, Mumbai awards for his contribution in cancer research. Presently, he is heading Department of Molecular Medicine & Biology at Jaslok Hospital & Research Centre, Mumbai for last 9 years. He has successfully sequenced BRCA1 and BRCA2 genes and Wilson Diseases gene in his laboratory and discovered specific novel mutations in Indian population. He is associated with many organizations and hold positions in their committees. He was honored with position of a Secretary for Scientific Advisory and Ethics Committee of Jaslok hospital for 5 years. He is presently "Vice President" of "Molecular Pathology Association of India (MPAI), upcoming organization in the field of Molecular Pathology. He has more than 50 publications in national & international journals, appointed as a reviewer for many national and international journals and attended several conferences, workshops and seminars all over India and abroad. His name is also included in Marquis Who's Who in World" Book 2012.

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