

Cell density influences expression of pluripotency genes and differentiation in colorectal cancer cells

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Recent understanding of colorectal tumours (along with other tumour cell types) indicates that they contain a small population of cancer stem cells (CSC) that are capable of self-renewal and generation of all the differentiated cell types in the tumour. Another feature of colorectal tumours is that the cells appear to undergo a transition at the invasive front, that endows the tumour cells with the ability to invade and metastasize. This process resembles the epithelial- mesenchymal transition (EMT). A possible link between these two processes, has recently been identified when it was shown that normal mammary epithelial cells that were induced to undergo an EMT, acquired stem cell characteristics. An *in vitro* system that mimics the changes occurring in colorectal cancer cells during EMT would be significant in identifying factors involved in these changes. The colon cancer cell line, SW480, when grown to low or high cell density resembles cell populations at the invasive front (mesenchymal-like) and central mass (epithelial-like) of the tumour, respectively. We show that *Brachyury*, is differentially expressed in SW480 cells, being present in low density cells. We also show that *Brachyury* expression is regulated by the Wnt-signaling effector, beta-catenin in a density dependent manner. *Brachyury*/ *Nanog* expressing cells are also positive for colorectal cancer (CRC) stem cell (SC) marker. We propose a mechanism whereby expression of beta-catenin in low cell density cells induces the expression of *Brachyury* and *Nanog*, preventing differentiation. These *Brachyury* expressing cells may be the cancer stem cells as determined by CRC-SC marker expression.

Biography

Debalina Sarkar has completed her Ph.D. in cancer studies from University of Wales, Bangor. Her postdoctoral work is on hemophilia from University of Florida and on endocrine cancer from Harvard Medical School. She has published first author papers in journals like 'International Journal of Cancer' and have published editorials. She has served as the review committee for American Society of Gene & Cell Therapy annual meeting 2012. He also serves as the editorial board member for the journal Genetic vaccines and Therapy.

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