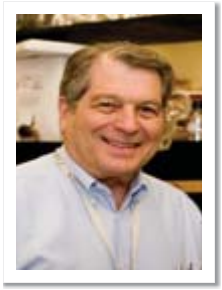
Stewart Sell, J Cell Sci Ther 2011, 2:4
doi: http://dx.doi.org/10.4172/2157-7013.S1.01

International Conference & Exhibition on
Cell Science & Stem Cell Research

29 Nov - 1 Dec 2011 Philadelphia Airport Marriott, USA



Dr. Stewart Sell

University at Albany, USA

Targeting stem cells in the treatment of breast cancer: An experimental mouse model directed to stemess gene BMI-1

We have developed a single breast cancer stem cell (CSC) model system based on the MMTV-PyMT transgenic mouse that is used to show potential differentiation therapy of breast cancer by blocking expression of the stemness gene Bmi-1 The feasibility of a single-cell model of tumor initiation and metastasis for solid tumors remains controversial. We report here multiple lines of experimental evidence that validate a single-cell CSC tumor initiation model for solid tumors in immunocompetent hosts. Using a FACS protocol for a defined set of cell surface markers, we characterized distinct tumor cell populations derived from transgenic MMTV-PyMT mice. Two tumor derived cell cultures, epithelilal cancer stem cells and tumor derived mesenchymal stem cells, were able to differentiate into several specialized lineages when cultured in selective media. When epithelial cells cultured from MMTV-PyMT breast cancers were tested by transplantion to syngeneic hosts for tumor initiation potential, the minimum number of cells to initiate tumors varied 1000-fold. The number of epithelial tumors cells required to initiate tumors was significantly reduced when the tumor cells were co-transplanted with tumor derived mesenchymal cells, but not with mesenchymal cells from other sources. Expression of the Bmi-1 gene and the presence of mesenchymal stem cells are necessary for reproducible single-cell tumor initiation. Blocking of expression of the Bmi-1 gene in either the epithelial cancer cells or the tumor derived mesenchymal cells by shRNA1 significantly reduced tumor initiation by the epithelial cells. Our experiments highlight the practical utility and potential translational significance of a single-cell CSC model to identify genetic and microenvironmental requirements for maintenance of a breast CSC phenotype and provide a pre-clinical model for differentiation therapy.

Biography

Dr. Sell received an MD from the University of Pittsburgh in 1960, residency in pathology at Massachusetts General Hospital, and fellowship training at NIH and U. Birmingham in England. He served on the faculty at Pitt; USCD; UT Houston; and Albany Medical College. He has published 265 research papers, 83 invited papers, 36 book chapters and 14 books. He has a paper listed as a "Citation Classic" by Current Contents and another as a "Scientific Landmark" by AACR. Awards include: Distinguished Scientist Award, IATMO; Virchow Award, LeadershipMedica; Legacy Laureate, Pitt (Highest Award for Alumni); and the Abbott Award of ISOBM,