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The similarities in the biology of normal and cancer stem cells when cultured on 3D-Nanofibrous scaffold systems

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Our long time experiences in dealing with cancer cell biology and cancer cell culture remarked that the cancer cell lines in culture systems were consisted of two groups of cells. One was the small cells with spherical shape and aggregated in small gape of cells found suspended or attached to bottom of culture flasks. The other was well differentiated cells that attached on the bottom of culture flasks. After treatments using anticancer drugs, these well differentiated cells were killed. And the typical of cell death including apoptosis and necrosis was dependent upon the mode of action of the molecule studied. However, the small cells with spherical shape still alive. This study aimed to monitor the behavior and to develop the functional biomarkers of cancer stem cells cultured on 3D culture system. Our results revealed that the cells have differential response and behavior when they were cultured in conventional and in 3D culture system. The 3D culture systems allow maintaining the microenvironments that influenced on growth and tissue organization. It can be suitable models for normal and cancer stem cell biomarker investigation. In order to expand our knowledge to *in vivo* situations, wistar rats with xenografted human cancer cells were used for testing the specificity and function of these discovered biomarkers by a clinically suitable imaging modality such as MRI, CT and SPECT. The study clearly showed that cancer stem cells can renew, proliferate and upon activation these cells may acquire the ability to give rise to cancer and preserved the similarities in the biology of normal stem cells.

Biography

SM is chief of the Department of Radiologic Technology and Director of the Center of Excellence for Molecular Imaging, Faculty of Associated Medical Sciences Chiang Mai University, Thailand.