

The video imaging of the behavior of Caco-2 cells in conventional and 3D culture system: Existence of small fraction of cancer stem cells in the cell line

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Cancer stem cells represent a subpopulation of cells within a tumor which is capable of initiating new tumors following a prolonged period of remission. Recently, we provide strong evidence that the Caco-2 cell lines consists of a small fraction of cancer stem cells. The cancer stem cells have similar characteristic like normal stem cell, mainly their ability to self-renew. This ability drives the proliferation and differentiation of tumor. However, the aptitude of giving new cancerous tissue originated from the Caco-2 cell lines was rarely studied. Indeed, these should be the important information supporting the idea of cancer stem cells. Therefore this study rigorously investigated the behavior of Caco-2 cells by culturing the cell in conventional culture technique and developed the 3D culture system using 3D-nanofibrous scaffolds fabricated by polyvinylidene

fluoride (PVDF) under microscope combined with video imaging system. It was clearly shown that only small fraction of cells entering to cellular kinetics and proliferation. While in 3D-nanofibrous scaffold systems allow culturing cells as long term culture yielding bio-artificial tissues that can easily characterized by SEM and EDX. The electron micrographs revealed that Caco-2 cells can originate completed tissue structure consists of vascular like and coated on the scaffolds; the top side presented micro villi homogenously covered and spread on the bio-artificial tissue corresponding to the intestinal tissue. In conclusion, the Caco-2 cell line consists of a small fraction of cancer stem cells and the cancer stem cells have self-renew and efficiently proliferate, differentiate and give a new tissue.

Biography

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