Identifying a Role for Mesenchymal Stem Cells Conditioned Media on Cancer Cell's Survival

Al Mohawes, Mohammed

Human Mesenchymal Stem Cells (hMSCs) possess a unique immune-regulatory property, which makes them an attractive candidate for cellular therapy for a variety of human diseases such as auto-immune, inflammatory and cancer. It is established that cancer manipulates the microenvironment to evade immune recognition, but the exact mechanism that regulates this process is not fully understood. The purpose of this study is to determine the effects of secreted factors, referred to as Conditioned Media (CM), from hMSCs on six cancer cell lines; Three breast (MDA-MB-231, MDA-MB-468, MCF7); One colon (HT-29); One head and neck (FaDu) and; One prostate (PC-3). Morphological changes of tumor cells were assessed using H&E staining and examined under a Nikon inverted microscope. Cell viability was assessed using the quantitative colorimetric AlamarBlue assay. All tested cancer cells seeded in CM from hMSCs showed dramatic morphological changes except FaDu and MDA-MB-468 cells. In CM, MCF-7 and H-29 showed more cell-cell adherence, while MDA-MB-231 lost the spindle shape and PC-3 lost elliptical shape and they became rounded. Viability of all cancer cell lines were significantly ($p < 0.05$) enhanced in cells that were seeded for up to 4 days in CM comparing to fresh media. After 6 days in CM, MCF-7 and PC-3 did not show significant differences in viability as compared with cells seeded in fresh media. These data provides new insight on the biological interaction between hMSCs and cancer cells while providing the foundation for future utilization of hMSCs as anti-cancer cellular therapy.

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