MORPHOMETRIC CHARACTERISTICS OF CANCER CELLS GROWN IN EMBRYONIC MICROENVIRONMENT AND UNDER ANTIVIRAL TREATMENT

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Introduction: Aggressive cancer cells express markers of multipotent stem cells and tightly interconnect with its surrounding microenvironment, by which the differential plasticity of cancer cells and also its carcinogenicity is regulated. Based on the fact that both cancer cells and stem cell use the same signaling molecules for self-renewal and differentiation, it is hypothesized that embryonic microenvironment, which is modulated by stem cells and is essential for stem cells differentiation, can be used for changing the morphometric characteristics of cancer cells and as a result lead to reprogramming of aggressive cancer cells malignant phenotype into more benign phenotype. The same is stated regarding antiviral agent, which is shown to change morphological characteristics and properties of malignant phenotype of cancer cells.

Methods: The objective of the study is to evaluate morphometric characteristics of two highly metastatic cell lines U118 (glioblastoma) and MCF7 (breast cancer) grown in embryonic microenvironment such as chicken embryo extract (CEE) and under antiviral treatment such as Acyclovir (ACV) by comparing non-treated cells with cells after CEE and ACV. The properties were examined by the colony formation on soft agar, viability assay detected the number of cells survived after treatments. Cancer stem cell marker aldehyde dehydrogenase enzyme activity was measured and the concentration was compared. The presence of viral antigens was identified by immunofluorescence analysis.

Results: Results demonstrated reduced number of colonies formed after treatment with CEE and ACV. The shape of colonies formed after treatment were smooth and round compared to the colonies formed before treatment which appear to be rough. Viability assay demonstrated low survival of cancer cells after treatment. The concentration of ALDH activity was also appeared to be reduced. The viral presence was evident on the surface of both treated and untreated cells. The emission intensity after treatment was lower which can be the results of blockage of the signal.

Conclusion: The study showed that morphometric characteristics of cancer cells that undergone CEE and ACV treatment differ of that did not have treatment. The viral presence in cancer cells is evident with lower emission signal after treatment.