The Effect of Expression of miRNA-15b on the Migration of Glioblastoma Multiforme

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Glioblastoma multiforme (GBM) is a highly malignant astrocytoma due to an elevated reproductive rate and plentiful blood flow to the region. It is resistant to conventional treatments, and new medications or therapies have been difficult to develop. MicroRNAs have great regulatory power, regulating hundreds of mRNA, and thus crucial functions such as cell growth, differentiation, and death. Many recent sources have implicated different miRNAs in regulation of gliomagenesis and cell migration in GBMs. Although miRNA-15b upregulation has been implicated in decreased cell growth, no research has yet investigated its effect on migration of GBM cells. This was investigated by conducting a fluorescent format Transwell migration assay on cells expressing miR-15b and normal GBM cells as a control. GBM cells were transfected with Lipofectamine RNAiMAX to induce miRNA-15b expression. It was expected that, like many other miRNAs (ex. miR-124) that inhibit cell proliferation, miR-15b would inhibit migration. The amount of cells in the controls versus the transfected cells was quantified by lysing and dying migratory cells and running samples through a Cary Eclipse fluorescent spectrophotometer. Intensity of fluorescence is proportional to number of migratory cells present. The controls fluoresced more than the transferred cells with an average intensity of 874.5 au versus 630.4 au, indicating a higher number of migratory cells in the controls and showing miR-15b expression in GBM cells inhibits migration. Statistical significance was confirmed with a chi square test (p-value<0.001). These findings support its viability as a tumor suppressor.

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