NEURON-GLIA INTERACTIONS: PROPERTIES OF HUMAN GLIOBLASTOMA CELLS

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The interactions of neurons and glial cells are imperative for the brain development. Growth factors and extracellular matrix (ECM) elements play important role in these interactions, especially laminin, which has been shown to be a good substrate for neuronal development. The glioblastoma multiform (Gbm) is the major malignant primary brain tumor and its characteristic invasion pattern suggests that it is well adapted to the CNS microenvironment. Using a neuron-glial cells co-culture, we verified that human glioblastoma cells, as well as astrocytes, maintained the ability to support neuritogenesis, whereas non-neural normal or tumoral cells failed to do so. Interestingly, the laminin organization on both normal and malignant glial cells was altered, from a filamentous arrangement to a mixed punctuate/filamentous pattern under neuronal influence. Normal neurons can also influence the expression of the extracellular matrix by controlling the growth factors Connective Tissue Growth Factor (CTGF) and Transforming Growth Factor- □1 (TGF□1). RT-PCR analyses showed that CTGF, but not TGF□1 expression decreased when Gbm cells were cultured in contact with neonatal rat neurons. These neuronal effects are not dependent on the soluble factors secreted by the neurons. However, conditioned medium secreted by Gbm support neuron proliferation, differentiation and growth. Together, these results contribute to better understand the glioblastoma behavior in the brain microenviroment and suggest that glial tumors keep fundamental properties in relation to contact with neurons.