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Glioblastoma Stem Cells

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ABSTRACT

Glioblastoma multiforme(GBM) is the most common and malignant primary brain tumor in humans. GBM accounts for 55% of all primary brain cancers, with a median survival rate of 14.6 months. The grim prognosis of GBM can be attributed to glioma stem cells (GSCs), which initiate tumor formation through the stem-like properties of self-renewal and differentiation. The ability of GSCs to resist radiation and chemotherapy contributes to the high rate of tumor recurrence in GBM patients. Consequently, novel therapies that effectively target the population of GSCs are of vital importance.

A promising is to induce the differentiation of GSCs. Previous studies show that inactivation of gene X enhances self-renewability in embryonic stem cells. Therefore, we hypothesized that gene X facilitates the resolution from self-renewability toward differentiation in GSCs.

In order to test this hypothesis, we made DNA constructs that overexpress or knockdown gene X. To overexpress gene X, the coding sequence was cloned into a shuttle vector pSKSP, and then sub-cloned into a lentiviral vector CSC. To knockdown gene X, the shRNA oligos were first cloned under the control of the U6 promoter. The U6-shRNA was then cloned into a lentiviral vector pHIV. After confirmation by sequencing, maxiprep of the DNA constructs was performed.

These constructs will be used to overexpress or knockdown gene X in GSCs to test GSC self-renewal and differentiation.

Keywords: Gliobastoma Multiforme (GBM), Brain Tumor, Glioma Stem Cells

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