Human NT2 Neural Precursor-Derived Tumor-Infiltrating Cells as Delivery Vehicles for Treatment of Glioblastoma.

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Neural stem cells used as a cellular vehicle have been proven effective in targeting glioblastomas in animal models. In an attempt to identify human sources of such cellular vehicles other than human brain tissues, we tested whether the well-established human NT2 cell line, which share many characteristics of neural precursor cells, can be used to derive new cellular vehicles with glioma tropism. After treating NT2 cells with retinoic acid for 2 weeks, we isolated using Boyden chambers a group of NT2 cells that migrated towards human U87 glioblastoma cells. In mice, these cells could home in on intracranial U87 glioblastoma xenograft following systemic administration into the tail vein. To test the feasibility of using these tumor-infiltrating cells for targeted glioma therapy, we injected them, after introducing the herpes simplex virus thymidine kinase gene into the cells, into the brain side contralateral to a site pre-inoculated with U87 cells. Following ganciclovir injection, we observed inhibition of tumor growth and significantly prolonged survival of tumor-inoculated animals. NT2 cells are stable, easy to cultivate and amenable to scale-up for cell production, thus our method holds promise for generating human cell-based delivery vehicle for clinical cancer therapy.

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