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A new approach in gene therapy of glioblastoma multiforme

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Olfactory Ensheathing Cells (OECs) of human olfactory mucosa are a type of glial-like cells that possess good migratory and tropism properties. We believe that neuronal-derived vehicle may have better capability to receive to the site of injury. In addition, obtaining of such vehicle from the patient reduces risk of unwanted complications. So, in this study, we investigate whether human olfactory ensheathing cells can be used as a cell source for the first time in gene delivery to assay the tumoricidal effect of herpes simplex virus thymidine kinase gene (*HSV-tk*) on glioblastoma multiforme (GBM). We obtained OECs from superior turbinate of human nasal cavity mucosa, and cell phenotype was confirmed by the expression of cell-specific antigens including low-affinity nerve growth factor receptor (p75 neurotrophin receptor), microtubule associated protein-2 (MAP2), and S100 calcium binding protein B (S100-beta) using immunocytochemistry. Then, these cells were transduced by lentiviral vector for transient and stable expression of the herpes simplexvirus thymidine kinase gene (*OEC-tk*). The migratory capacity of *OEC-tk*, their potency to convert prodrug ganciclovir to toxic form, and cytotoxic effect on astrocyte cells were assayed *in vitro*. The OECs showed fibroblast-like morphology and expressed specific antigens such as p75 neurotrophin receptor, S100-beta, and MAP2. Our results indicated that *OECs-tk* were able to migrate toward primary cultured human glioblastoma multiforme and affected survival rate of tumor cells according to exposure time and concentration of ganciclovir. Also, *OECs-HSV-tk* was capable of inducing apoptosis in tumor cells. Our findings suggest that human OECs could employ as a possible tool to transfer anticancer agent in gene therapy of brain tumor.

Biography

Homayoun Hadizadeh Kharazi completed his MD in Iran and worked as General Practitioner for 10 years. He then moved to Canada and completed his PhD in Neuroscience at University of Ottawa followed by completion of his Post-doctoral fellowship in Cellular and Molecular Medicine Department at University of Ottawa. He worked as scientific evaluator for Health Canada until his return to home country. He has published several papers in prestigious scientific journals.

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